Vapor Bus International

A Wabtec company

Engineered Bus Door Systems

CLASS Diagnostic Software User Manual Revision AL

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For CLASS v3.34 and Voice Annunciator v0.47

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CLASS Diagnostic Software

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1 Definitions

- ***DFO*** (**D**oor **F**ully **O**pen) is determined by activation of a switch or sensor when the door reaches the fully open position.

- The ***Drunk Alarm*** mode is activated by a specific input (IN2 or /IN2).

  When activated, if the door is both fully closed and is not enabled, the appropriate sensors will be activated for short bursts at recurring intervals.

  Any targets seen at those times will be annunciated by means of a specific output (*OUT2 MSU* for CLASS 2, */DA-O* for CLASS 3)

  The ***Drunk Alarm*** Mode activation will be temporarily ignored any time the door is not fully closed or is enabled - during that time normal operation of the sensors will take place.

- The ***MSU*** is the **M**iddle **S**ensor **U**nit.

- **TARGET:** An object detected by CLASS' sensing system.

  Fixed Target: a Target that is part of CLASS' "fixed" environment, i.e., always present. Fixed Targets may be permanently programmed by the installer or may be automatically determined by CLASS at turn-on

  Acquired Target: a Target that is not "fixed"; typically a passenger.

- ***TTO*** (**T**ouch **T**o **O**pen) is an operational state of the CLASS controller. In the TTO state, the door has been unlocked or authorized (typically the Green Light is on) and CLASS is waiting for a target detection (or a signal from 5 degree switch that the door has been pushed open beyond its activation point). Upon either of those events, CLASS will issue a Door Open Request.

  See No 5° Open 14 for an exception to the above.

  Normally, Panel Sensors are active in the TTO state; the MSU may also be activated depending on MSU TTO Mode 15

- The ***Status Light*** will be turned on when CLASS detects an error condition. (Note CLASS will continue to function.)

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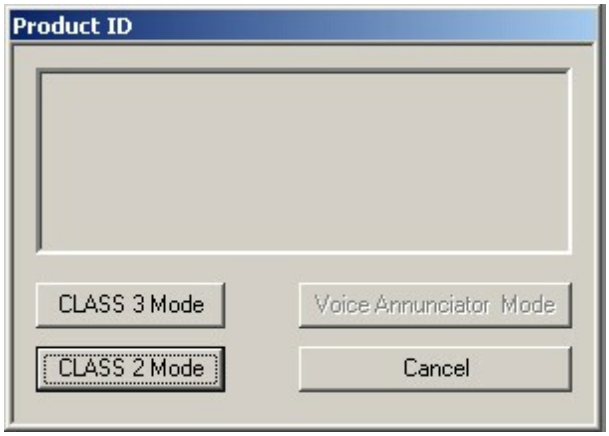
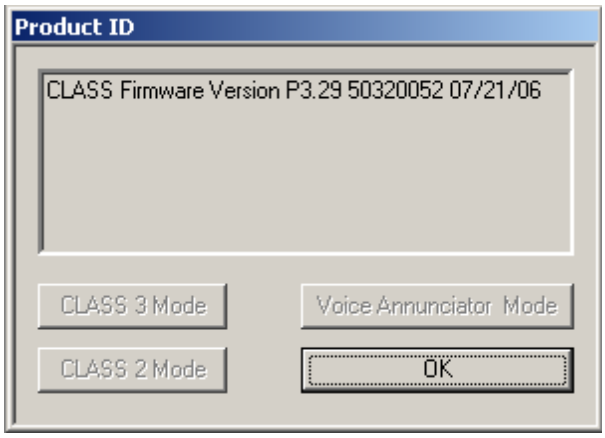
2 Product ID

Connected to CLASS 2 Controller:



To initiate communication: Press the *CLASS 2 Mode* Button

Connected to CLASS 3 Controller:



To initiate communication: If the Cancel/OK button says "OK", press it to continue. Otherwise, press the *CLASS 3 Mode* Button

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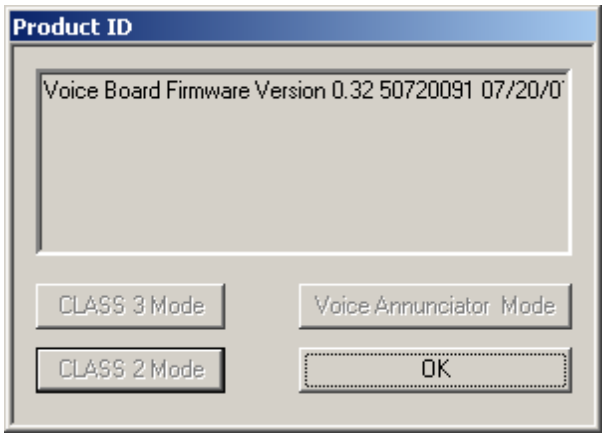
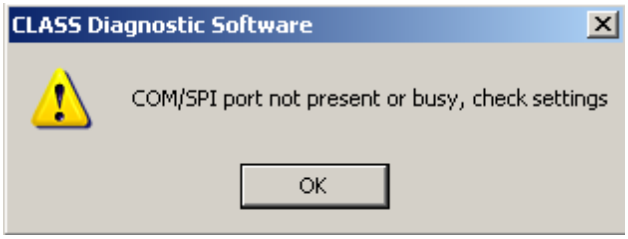
Connected to Voice Annunciator:



To initiate communication: If the Cancel/OK button says "OK", press it to continue. Otherwise, press the *Voice Annunciator Mode* Button



If, instead of connecting, the warning message is seen, it indicates that there is something in the computer running the CLASS Diagnostic that is preventing access to the COM (serial) port. This is usually caused by some other software program (such as a PDA or Blackberry interface) having "grabbed" the COM port. It is NOT a problem with the CLASS Diagnostic, and must be rectified by the user before the CLASS Diagnostic program can be used. Typically this is solved by closing the program using the port and restarting the CLASS Diagnostic.

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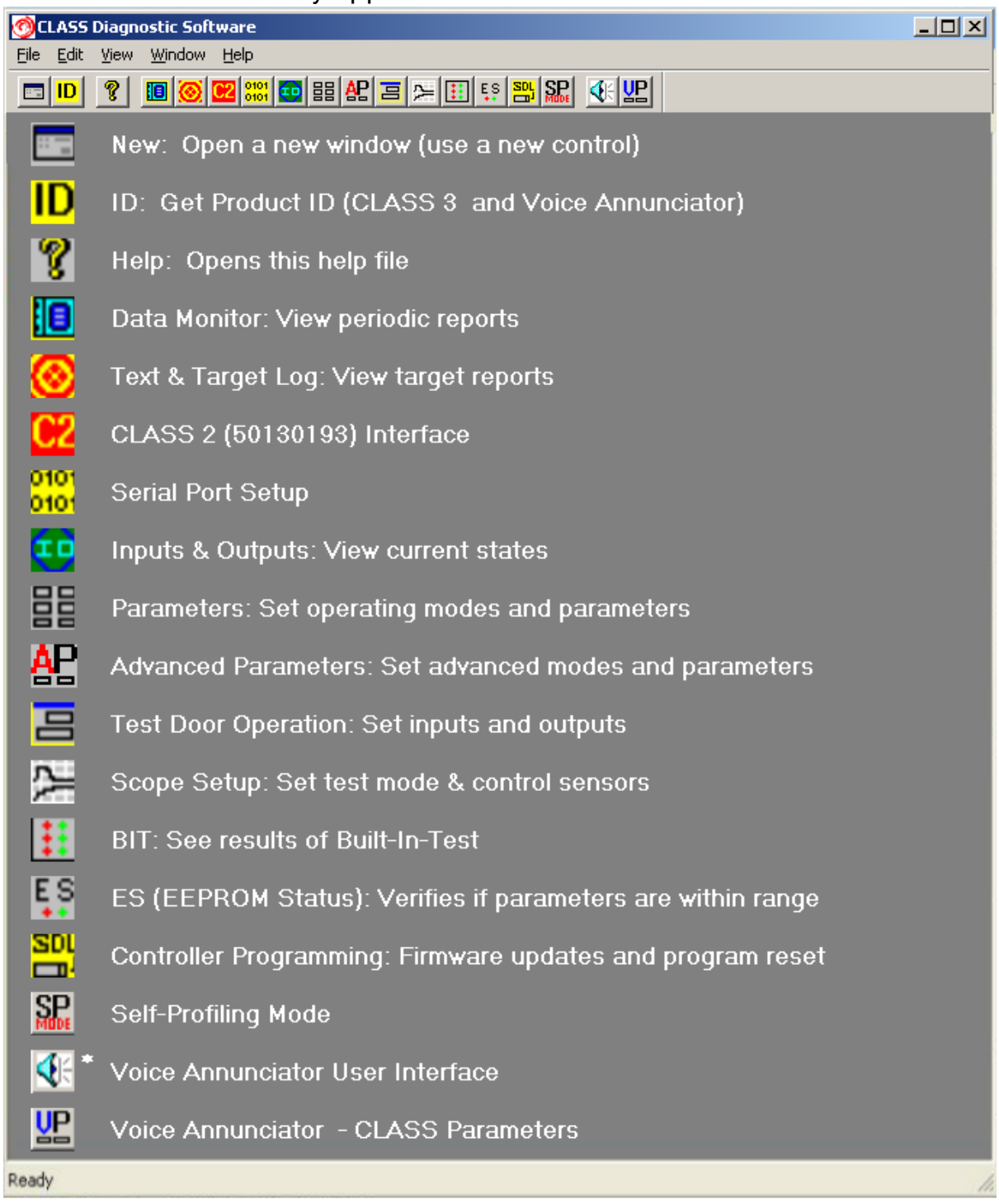
3 Toolbar Buttons

* indicates button is only applicable to Voice Annunciator


CLASS Diagnostic Software
File Edit View Window Help
New: Open a new window (use a new control)
ID: Get Product ID (CLASS 3 and Voice Annunciator)
Help: Opens this help file
Data Monitor: View periodic reports
Text & Target Log: View target reports
CLASS 2 (50130193) Interface
Serial Port Setup
Inputs & Outputs: View current states
Parameters: Set operating modes and parameters
Advanced Parameters: Set advanced modes and parameters
Test Door Operation: Set inputs and outputs
Scope Setup: Set test mode & control sensors
BIT: See results of Built-In-Test
ES (EEPROM Status): Verifies if parameters are within range
Controller Programming: Firmware updates and program reset
Self-Profiling Mode
* Voice Annunciator User Interface
Voice Annunciator - CLASS Parameters
Ready

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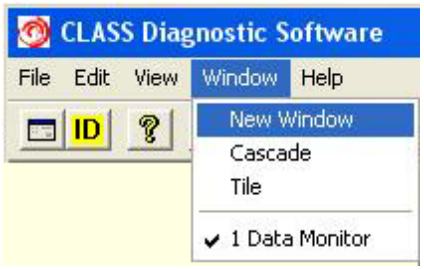
4 Controls Window

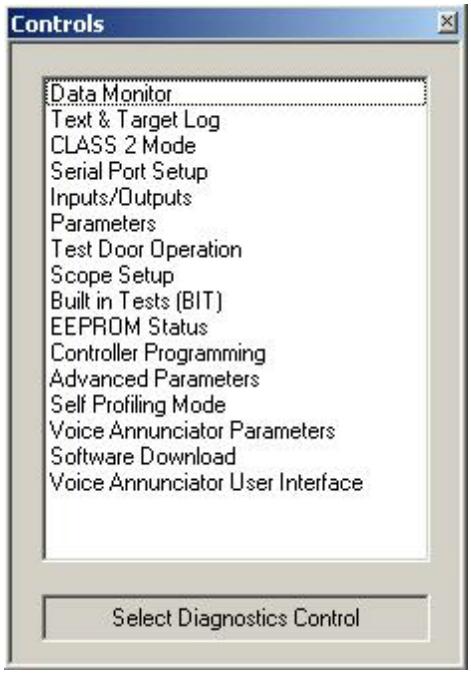
The diagnostic's various "windows", such as *Parameters*, *Scope Setup*, etc., are known as controls

To select any control, use the Menu Bar to select either:

File➔New or *Window➔NewWindow*



Then double-click on the desired control.



Or use the associated Toolbar Buttons 4.

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5 CLASS 3 (50330055)

5.1 Step-By-Step Setup

New CLASS 3 Controller Installation – Step-by-Step Basic Setup

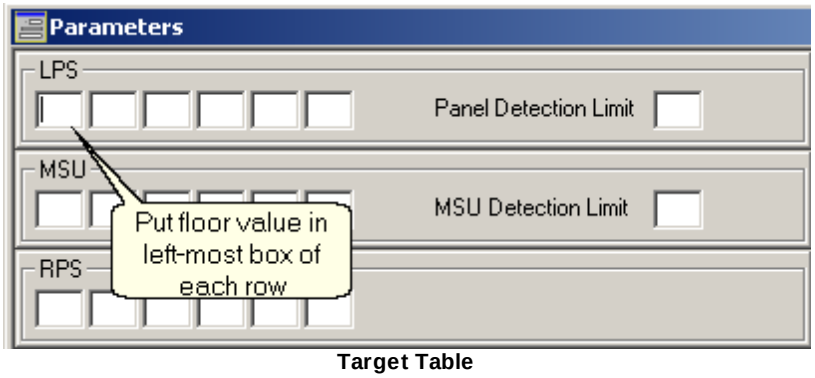
Assumptions

- These instructions explain the basic steps to follow when configuring a CLASS controller for a specific environment.
- These instructions apply to typical buses – LRVs may require a different approach (not covered in this document.)
- CLASS Controller and sensors are fully installed and correctly wired.
- Bus PLC is correctly programmed
- Bus is fully operational
- Laptop with CLASS Diagnostic and Oscilloscope are correctly connected.
- These instructions cover performance-related settings. Customer preferences, such as Drunk Alarm settings, Driver-Controlled operation, etc, must be ascertained and programmed separately.

Note: make sure that the door is closed and clear of any non-fixed targets any time that CLASS is turned on or Reset (i.e., stand out of the way).

BASIC SETUP

1. Turn CLASS off.
2. Measure & record the distance in centimeters from each sensor face to the floor.
3. Make sure the door is closed and clear
4. Turn CLASS on.
5. Run CLASS Diagnostic.
6. Insert the distances measured in Step 2 into the appropriate left-most target table boxes (see below)



Target Table

7. Clear out all the other values in the target tables (set to '0')
8. Verify that *VREF Normal* is set to *2.00* and *VREF Calibration* is set to *0.50 (see below)*

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9. Click on Save to EEPROM to upload the revised table
10. Click on Reset Controller to reset and re-learn targets.

11. Examine the target table for any new "learned" targets (other than the floor). For each target, determine the physical cause.

One method of determining the physical cause is by use of the oscilloscope connected to the appropriate sensor. While observing the scope, use a movable target (a hand, an extended tape measure, etc.). Move the target closer to or further away from the sensor until the target's echo coincides or overlaps the echo being investigated. The moving target will then be at the same position as the target being investigated.

A second method is to use the scope to display the distance to the target being investigated (refer to the *CLASS Oscilloscope Setup User Manual* for setup) and then use the tape measure to find whatever is at that distance from the sensor.

One the physical cause is determined, measure the actual distance, and insert the measured distance in the target table in place of the "learned" value.

Note: the actual distance should be used in place of the "learned" distance because the learned distance is based on an assumption of the speed of sound based on room temperature. Depending on actual air temperature, the actual distance may be somewhat different than the learned distance; using the actual distance will allow the full built-in tolerance range to be used.

Reminder: Always make sure to clear (set to '0') any values that you do NOT want programmed before clicking Save to EEPROM

12. Click on Save to EEPROM to upload the revised table.

13. Click on Reset Controller to reset and re-learn targets.

14. Test the door operation.
    a. Verify that when enabled, the door does not open until a valid target (hand) is sensed.
    b. Verify that the door will close and does not 'flap' (re-open one or more times while attempting to close).
    c. Repeat 14.a and 14.b several times.

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15. Using the oscilloscope, monitor each sensor. (Use *Persistence* if appropriate. This will allow the scope traces to build up over time so that higher-amplitude echoes that only occur sporadically may be seen.) For each sensor:
    a. Look for any echo either close to or greater than 0.5V. For any such echo, determine its physical cause and its distance from the sensor, and verify that it is already in the target table. If not in the table, decide if it should be in the table by observing its maximum amplitude over a few minutes' time (by using *Persistance*) and by assessing the ambient air temperature. (If the air temperature is warm, the amplitude will likely be higher when the temperature is colder.) If the echo is not significantly greater than 0.5V and the air is cool, it is safer to omit the target. Otherwise, add it in. If the *VREF Normal* will be reduced below 2.00V for greater sensitivity, it will be more risky to omit targets.
    b. For all sensors, but especially for the MSU, perform step 15.a over the full range of door movement by dumping the air and slowly moving the door while observing the oscilloscope.

16. Set the *MSU Detection Limit* as follows:
    a. The goal of using *MSU Detection Limit* is to reduce the number of fixed targets in the MSU table.
    b. Since:
        i. targets detected while the door is opening do not matter (the door is already in the process of opening so a further door-open request is superfluous)
        ii. the MSU is typically not turned on until the door reaches fully open
        iii. targets on the doors such as brush covers are typically not seen when the door is fully open
        iv. But: these targets will be seen at turn-on calibration (doors are closed) and added to the MSU target table, thus causing unnecessary dead-zones.

So: note or measure the distance to the **closest** target (smallest distance) which is not visible at door fully open and then set the *MSU Detection Limit* to 94% of that distance (distance x 0.94). (See Target Table figure above)

    c. If the targets are seen at door fully open, set the *MSU Detection Limit* equal to the MSU floor value. This will maximize CLASS coverage.

17. Assuming that targets can not be seen at door fully open, click on

to turn it on.

    Then, once *MSU Target Reduction* is enabled, any MSU targets at distances beyond the *MSU Detection Limit* (but not including the floor) which can not be seen when the door is fully open may be removed from the target table.

    Caution : If *MSU TTO Mode* is turned on, the MSU will be ON at door fully closed down to 110 cm. (condition 16.b.ii will no longer be true) so if the *MSU Detection Limit* is set at less than 110 cm, any targets between the detection limit and 110 cm will be seen.and therefore must be left in the table. If the *MSU Detection*

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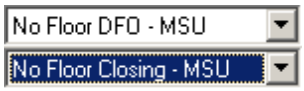
Limit is greater than 110 cm, then *MSU TTO Mode* is fully compatible.

18. No Floor Mode: Turn on *No Floor DFO - MSU* and *No Floor Closing - MSU*.



Make sure to verify that the MSU receives a strong floor signal at all times if these modes are used (this typically requires using an oscilloscope).

19. No 5° Open: The standard setting for *No 5° Open* is ENABLED. At the very least, it should be ENABLED for standard Slide-Glide doors, or any doors not having a positive locking mechanism. (If *No 5° Open* is not enabled, when the door is authorized and pushed in a manner to move past the 5° point without being detected by a CLASS sensor, the controller will issue a door-open request.)

20. Make sure that unless *Relay Mode* is being used, *Hold Open Timer 1* is set to be less than *Open Request On Time*. (Typically, *Open Request On Time* is set to 0.3, and *Hold Open Timer 1* is set to 0.1.)

21. Click on

to upload the revised table

22. Click on

to reset and re-learn targets. Observe whether new (un-programmed) targets have been learned and, if so, why. Then re-configure accordingly.

23. Fully test the settings by operating the door and observing its operation.

24. Save your configuration by using

with an appropriate filename (typically includes builder, transit authority and bus number, such as *NFI-CTA-Bus 999*)

References

- **CLASS Diagnostic Software User Manual (Help file, online or PDF)**
- **CLASS Oscilloscope Setup User Manual (Help file, online or PDF)**
- CLASS Theory of Operation (TB08-05-096)
- CLASS Installation and Setup (TB08-03-192)

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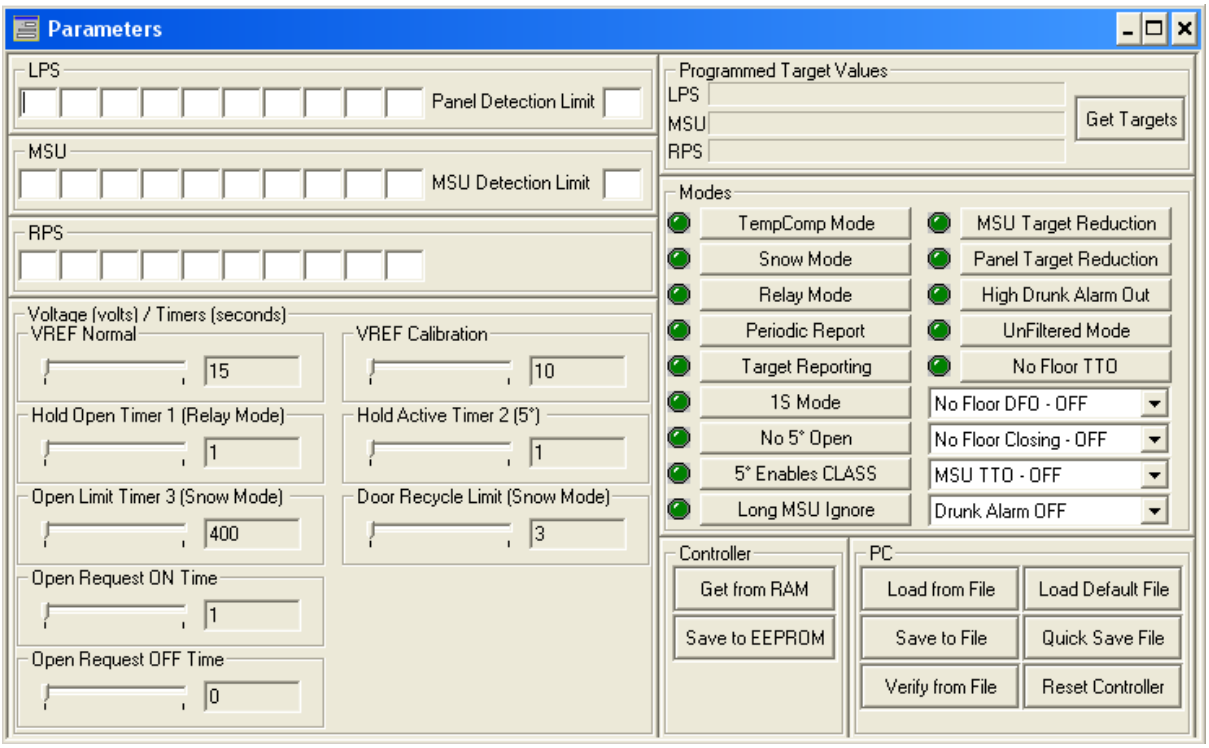
5.2 Parameters Window



NOTE:
Modes may be changed at any time.
The new values will take effect immediately, but will remain in effect only until the next Reset Controller 23 if not saved.

Changes to Voltage/Timers will not take effect until saved.

Changes to Targets will not take effect until saved and reset.

To permanently save changed parameters, click Save to EEPROM 23. To reset, click Reset Controller 23.

5.2.1 Allowable Range

Parameter	Min	Default	Max	Unit
LPS,MSU	30	85,187	255	cm
MSU	30	199	255	cm
MSU Detection Limit	60	90	[MSU Floor]	cm
VREF Normal	0.29	2.00	5.00	V

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VREF Calibration	0.29	0.50	5.00	V
Hold Open Timer 1 (Relay Mode)	0.1	1.00	10.0	sec
Hold Active Timer 2 (5º)	0.01	1.00	10.00	sec
Open Limit Timer 3 (Snow Mode)	4.00	4.00	20.00	sec
Open Request ON Time	0.01	0.30	1.00	sec
Open Request OFF Time	0.00	0.00	2.00	sec
Door Recycle Limit (Snow Mode)	3	3	10	#

See EEPROM Status 47 for more information.

5.2.2 Targets

5.2.2.1 General Notes

- A target is entered as a distance (in centimeters) from the face of the sensor to the fixed object.
- The first (left-most) box MUST contain the distance to the floor.
- If TempComp Mode 13 is enabled, the second box MUST contain the distance to the cooperative object. (This applies only to LPS & RPS.)
- The next boxes contain any other fixed objects (e.g., brushes, handles, window ledges, etc.)
- Boxes MUST NOT be left empty - if no fixed target exists for a given box, a '0' must be entered.
- A zero ('0') is not allowed between any non-zero fixed targets; all zeros must be to the right. (The first zero encountered stops the reading of further target boxes for the specific sensor.)
- Fixed target values will also appear in the boxes at CLASS™ turn-on as a result of the turn-on calibration. The values seen will therefore be a combination of any values previously programmed and those detected at turn-on. (To determine which targets are programmed and which are detected at turn-on, refer to Programmed Target Values 13 .)

5.2.2.2 LPS

The boxes under ***LPS*** (Left Panel Sensor) are to enter/display fixed targets 1 seen by the LPS.

Range: Min = 30 Default = 85, 187 Max = 255

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See Parameters Window 10 for control location.

5.2.2.3 Panel Limit

Panel Limit: The maximum distance from the Panel sensors (in centimeters) at which the Panel sensors will detect a target while the door is nearly closed (5º switch is active), if Panel Target Reduction 19 Mode is enabled. This is used to prevent the Panels from "seeing" extra targets while the doors are closed.

Range: Min = 30 Default = 110 Max = [LPS or RPS Floor value (whichever is smaller)]

See Parameters Window 10 for control location

5.2.2.4 MSU

The boxes under ***MSU*** (Middle Sensor Unit) are to enter/display fixed targets 1 seen by the MSU.

Range: Min = 30 Default = 199 Max = 255

See Parameters Window 10 for control location.

5.2.2.5 MSU Detection Limit

The box adjacent to ***MSU Detection Limit*** allows entry of the maximum distance (in centimeters) that the MSU will detect a target while the door is closing (< 85º on closing). This is used to prevent the MSU from "seeing" brushes, etc. and when used with MSU Target Reduction 15 may allow the elimination of some MSU dead zones at door fully open.

CAUTION: MSU Target Reduction 15 is not compatible with MSU TTO Mode 15 if the *MSU Detection Limit* is set to less than 110 cm since the MSU will not be off at door fully closed.

Usage: see step #16 in Step-By-Step Setup 8

Range: Min = 60 Default = 90 Max = [MSU Floor]

See Parameters Window 10 for control location

Also see MSU Target Reduction 15 and MSU TTO Mode 15.

5.2.2.6 RPS

The boxes under ***RPS*** (Right Panel Sensor) are to enter/display fixed targets 1 seen by the RPS.

Range: Min = 30 Default = 85, 187 Max = 255

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See Parameters Window 10 for control location.

5.2.2.7 Programmed Target Values

Clicking on ***Get Programmed Targets*** will get any existing programmed fixed target values from the controller and insert those values in the LPS, MSU, and RPS *Programmed Target Values* boxes as appropriate. Note these values will NOT include any un-programmed targets seen at turn-on.

See Parameters Window 10 for control location.

5.2.3 Modes

5.2.3.1 TempComp Mode

When enabled, ***TempComp Mode*** enables the CLASS™ system to improve its accuracy by measuring the temperature of the air near its sensors. Use of this mode requires that a "cooperative object" (a fixed object whose distance to the sensor is accurately known) be available for each sensor and its distance from the sensor be entered in the second box of the sensor's fixed objects table.)

See General Notes 11 for target placement when using this mode.

See Parameters Window 10 for control location.

5.2.3.2 Snow Mode

When enabled, the ***Snow Mode*** provides a way for CLASS™ to dynamically reduce its sensitivity to help deal with a target that occurs after turn-on calibration, such as that which might occur due to a build-up of wet snow on the door panels.

See also Open Limit Timer 3 (Snow Mode) 21 and Door Recycle Limit (Snow Mode) 21.

See Parameters Window 10 for control location.

See CLASS™ 3 Theory of Operation (TB08-05-096) for a more detailed explanation of Snow Mode and its parameters.

5.2.3.3 Relay Mode

Relay Mode is used on buses whose doors are not controlled by a bus computer or PLC. When enabled, it ensures that the Door Open Command will remain active at least until the door reaches fully open.

See also: Hold Open Timer 1 (Relay Mode) 20

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See Parameters Window 10 for control location.

5.2.3.4 Periodic Report

When ***Periodic Report*** is enabled, CLASS™ will supply a constant data stream to a laptop detailing its system states and operation. This is intended only for advanced troubleshooting.

See Parameters Window 10 for control location.

See PeriodicReport Definition 82 for data stream definition.

TIP:
Note that using the Inputs/Outputs Window 44 will provide the same information in an easier-to-interpret format and does not require turning on Periodic Report.

Important: *Periodic Report* should be turned OFF for normal operation.

5.2.3.5 Target Reporting

When ***Target Reporting*** is enabled and any target is detected, CLASS™ will supply a data stream to a laptop identifying the sensor that saw the target and the calculated distance (in centimeters) to that target.

See Parameters Window 10 for control location.

Note: *Target Reporting* should be turned OFF for normal operation.

5.2.3.6 1S Mode

1S Mode is ONLY to be used for a "single-sensor" installation. It will turn off error detection for LPS/RPS. Note that MSU TTO Mode 15. must be enabled separately if that function is required.

See Parameters Window 10 for control location.

5.2.3.7 No 5° Open

In typical operation, assuming the door is enabled or unlocked, CLASS will issue a door open request if it senses a target OR if the door is pushed open beyond the 5° switch actuation point. Enabling the ***No 5° Open*** mode will cause CLASS to ignore the 5° switch as a door open request input.

See Parameters Window 10 for control location.

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5.2.3.8 Long MSU Ignore

If ***Long MSU Ignore*** mode is enabled, after 30 seconds of continuous MSU target detection CLASS will ignore further inputs from the MSU until the door is closed.

(The goal of this mode is to ensure that the door can always be closed.)

See Parameters Window 10 for control location.

5.2.3.9 MSU Target Reduction

MSU Target Reduction mode, when enabled, will cause the MSU to ignore the memorizing of any fixed targets beyond the MSU Detection Limit 12. This may allow the elimination of some MSU dead zones at door fully open.

CAUTION: this mode is not compatible with MSU TTO Mode 79 if the MSU Detection Limit 12 is set to less than 110 cm since the MSU will not be off at door fully closed.

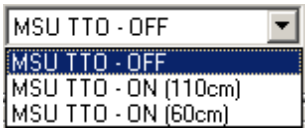
Usage: see step #16 in Step-By-Step Setup 8

See Parameters Window 10 for control location.

5.2.3.10 MSU TTO Mode

When enabled, ***MSU TTO Mode*** activates the MSU in the TTO 1 state so that it may respond to a passenger's request to open the door. (When not enabled, the MSU does not activate until the door reaches fully open.)

The choices appear when the drop-down arrow is clicked as shown below.



Options**:**

*MSU TTO - OFF**:*** turns off *MSU TTO Mode.*

MSU TTO - ON indicates that the sensor will only accept targets within 110 centimeters of the sensor.

MSU TTO - ON indicates that the sensor will only accept targets within 60 centimeters of the sensor.

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(This is most useful when the MSU is looking predominantly inside the vehicle to avoid nuisance activation from crush-load targets.)

CAUTION: this mode is not compatible with MSU Target Reduction 15 if the MSU Detection Limit 12 is set to less than 110 cm since the MSU will not be off at door fully closed.

See Parameters Window 10 for control location.

5.2.3.11 No Floor TTO

Normally, targets are detected by presence of an echo from that specific target. ***No Floor TTO*** mode allows an absence of an echo from the floor (while in the TTO 1 state) to be interpreted as a target. (This might occur if a sensor's sound pulse is "blocked" by a passenger's gloved hand, for example. The underlying assumption is that the floor should always be seen when the door is enabled; if it is not seen, it is because a passenger wishes to exit.)

When enabled, *No Floor TTO Mode* operates in addition to standard target echo detection. (So the gloved hand can block the floor echo, *or* its echo can be sensed as a target – either will trigger a response.)

No Floor TTO mode applies to all sensors that are active in the TTO 1 state (See MSU TTO Mode 15).
Note that if *No Floor* mode is active and ***BIT*** 78 fails due to a sensor's failure to see the floor, No Floor mode will be de-activated for the sensor that failed.

See also: No Floor DFO Mode 16. Note that *No Floor TTO* can be used in any combination with any of the other *No Floor* Modes.

See Parameters Window 10 for control location.

No Floor TTO requires CLASS 3 firmware (P/N 50320052) version 3.17 or greater

5.2.3.12 No Floor DFO Mode

When enabled, ***No Floor DFO Mode*** mode allows the absence of an echo from the floor to be interpreted as a target by the selected sensor(s), but ONLY during the time that the door is fully open. (See No Floor TTO 16 for more explanation.)

No Floor DFO Mode mode uses either the MSU, the Panel Sensors, or all, in various

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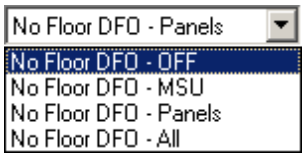
combinations.

The choices appear when the drop-down arrow is clicked as shown below.



When enabled, *No Floor DFO Mode* operates in addition to standard target echo detection.
Note that if *No Floor* mode is active and ***BIT*** 78 fails due to a sensor's failure to see the floor, No Floor mode will be de-activated for the sensor that failed.

See also: No Floor TTO 16. Note that *No Floor DFO Mode* can be used in any combination with any of the other *No Floor* Modes.

See Parameters Window 10 for control location.

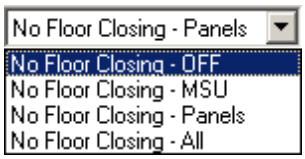
▶ **NOTE: Use of the *No Floor DFO Mode* with Panel Sensors is only advised when it is certain that the Panel Sensors are always able to to "see" the floor. This is typically true only for special applications (sliding pocket doors, etc.) and is not generally true on transit buses.**

5.2.3.13 No Floor Closing Mode

When enabled, ***No Floor Closing Mode*** allows the absence of an echo from the floor to be interpreted as a target by the selected sensor(s), but ONLY during the time that the door is closing. (See No Floor TTO 16 for more explanation.)

No Floor Closing Mode mode uses either the MSU, the Panel Sensors, or all, in various combinations.

The choices appear when the drop-down arrow is clicked as shown below.



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When enabled, *No Floor Closing Mode* operates in addition to standard target echo detection.
Note that if *No Floor* mode is active and ***BIT*** 78 fails due to a sensor's failure to see the floor, No Floor mode will be de-activated for the sensor that failed.

See also: No Floor DFO Mode 16. Note that *No Floor Closing Mode* can be used in any combination with any of the other *No Floor* Modes.

See Parameters Window 10 for control location.

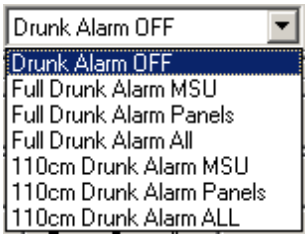
▶ **NOTE: Use of the *No Floor Closing Mode* with Panel Sensors is only advised when it is certain that the Panel Sensors are always able to "see" the floor. This is typically true only for special applications (sliding pocket doors, etc.) and is not generally true on transit buses.**

No Floor Closing Mode requires CLASS 3 firmware (P/N 50320052) version 3.21 or greater

5.2.3.14 Drunk Alarm

Drunk Alarm activates the Drunk Alarm 1 mode using either the MSU, the Panel Sensors, or all, in various combinations and with selectable ranges.

The choices appear when the drop-down arrow is clicked as shown below.



Ranges**:**

Full: indicates that the sensor will accept targets all the way to the floor.
110cm: indicates that the sensor will only accept targets within 110 centimeters of the sensor

See Parameters Window 10 for control location.

5.2.3.15 High Drunk Alarm Out

Normally, CLASS outputs are *active-low* (switched to ground).

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When ***High Drunk Alarm Out*** is enabled, the Recycle Request output is used for the Drunk Alarm function; its output is *active-high* (switched to bus supply voltage).

Note the Recycle Req function is inactive when ***High Drunk Alarm Out*** is enabled; the / Recycle Req output, which is *active-low*, remains active.

See Parameters Window 10 for control location.

5.2.3.16 5° Enables CLASS

Normally CLASS™ is enabled by one of Enable inputs becoming active. When the ***5° Enables CLASS*** mode is enabled:

a. Opening the door past 5º (deactivating the 5º switch) will also enable CLASS™.
b. Any target acquired in the *Door Is Opening* state will cause a door open request as long as the Enable inputs are NOT active.
(Normally, in the *Door Is Opening* state with Enable active, target acquisition will not cause door open requests to be issued since the door is already in the process of opening.)

Example uses:

- Driver-controlled door (no Enable signal available)
- With the emergency pulled and the door partially opened, CLASS™ will be enabled and able to send door open requests.

Note: when using ***5° Enables CLASS*** mode, it is strongly suggested to also enable No 5° Open 14 mode to prevent possible interaction.

Also: when using ***5° Enables CLASS*** mode, the MSU will turn on as soon as the door opens > 5° instead of waiting until fully open**.**

See Parameters Window 10 for control location.

5.2.3.17 Panel Target Reduction

Panel Target Reduction: When this mode is enabled:

1. Panel sensor targets that are below the Panel Limit 12 will not be added to the fixed target table during power-on calibration.
2. Panel sensors will only detect Targets above (higher up on the door than) the Panel Limit 12 while the door is nearly closed (5º switch is active.)

Default: Disabled

See Parameters Window 10 for control location.

5.2.3.18 Unfiltered Mode

UnFiltered Mode: When Unfiltered Mode is enabled, the six percent required between acquired targets is disabled during

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power-up Calibration Sequence.

NOTE: This mode is ONLY for use during installation to look for multiple targets that may be near each other. This is NOT for normal operation.

Default: Disabled.

See Parameters Window 10 for control location.

5.2.4 Voltage (volts)/ Timers (seconds)

5.2.4.1 Units and Setting Values

- Units: All voltages are in Volts; all times are in Seconds.

- To set or change values in the Voltage (volts) / Timers (seconds) section, either:
  a. Click on the slider pointer and slide it until the desired value appears
  b. Click on the slider pointer, then use arrow keys to set the value

See Allowable Range 10 for limits.

See Parameters Window 10 for control location.

5.2.4.2 VREF Normal

VREF Normal is the voltage level above which an echo will be considered a target. This value applies in normal running mode, and determines the overall sensitivity of the CLASS™ detection - the lower the value, the greater the sensitivity.

Allowable Range: Min = 0.29, Default = 2.00, Max = 5.00 (Volts)

See Parameters Window 10 for control location.

5.2.4.3 VREF Calibration

VREF Calibration is the voltage level above which an echo will be considered a target. Note this value applies ONLY in calibration mode (turn-on detection of "fixed" targets).

Allowable Range: Min = 0.29, Default = 0.50, Max = 5.00 (Volts)

See Parameters Window 10 for control location.

5.2.4.4 Hold Open Timer 1 (Relay Mode)

Hold Open Timer 1 (Relay Mode) is the time that the Door Open Command will remain active after the door reaches the 85º point (on opening). This parameter affects the Door Open Command only in Relay Mode 13; the Door Open Command will otherwise be controlled by Open Request ON Time 22

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HOWEVER: the parameter always (regardless of Relay Mode or not) has an internal affect on the operation of the firmware. For that reason:

CAUTION: The *Hold Open Timer (Relay Mode)* value should always be less than the Open Request On Time 22 value.

If this condition is not met, erratic operation or "flapping" may occur.

Allowable Range: Min = 0.10, Default = 1.00, Max = 10.00 (Seconds)

See Parameters Window 10 for control location.

5.2.4.5 Hold Active Timer 2 (5°)

Hold Active Timer 2 (5°) is the time that CLASS™ will remain active (and able to re-open the door) after the door reaches the 5º point (on closing). When Timer 2 times out, CLASS™ will continue to remain active only if the door is still enabled.

Allowable Range: Min = 0.01, Default = 1.00, Max = 10.00 (Seconds)

See Parameters Window 10 for control location.

5.2.4.6 Open Limit Timer 3 (Snow Mode)

Open Limit Timer 3 (Snow Mode) is the time that the CLASS™ unit will allow the door to remain open before activating the Snow Mode response (only applicable if Snow Mode 13 is enabled.) This timer starts when the door reaches the 85º point (on opening).

Allowable Range: Min = 4.00, Default = 4.00, Max = 20.00 (Seconds)

See Parameters Window 10 for control location.

See CLASS™ 3 Theory of Operation (TB08-05-096) for a more detailed explanation of Snow Mode and its parameters.

5.2.4.7 Door Recycle Limit (Snow Mode)

Door Recycle Limit (Snow Mode) is the number of times the door will be allowed to recycle open before activating the Snow Mode response (only applicable if Snow Mode 13 is enabled.)

Allowable Range: Min = 3, Default = 3, Max = 10

See Parameters Window 10 for control location.

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See CLASS™ 3 Theory of Operation (TB08-05-096) for a more detailed explanation of Snow Mode and its parameters.

5.2.4.8 Open Request ON Time

Open Request ON Time is the minimum time that the Door Open Command will remain active. This parameter is normally used only when NOT in Relay Mode 13.

Allowable Range: Min = 0.01, Default = 0.30, Max = 1.00 (Seconds)

The time the Door Open Command remains active depends on the setting of Open Request OFF Time 22.

If the *Open Request OFF Time* 22 is set to zero, the Door Open Request will be continuously active while any target is detected.
Once the target is removed, the Door Open Request will remain active for the *Open Request ON Time*.

If the Open Request OFF Time 22 is set to a non-zero value, while any target is detected the Door Open Request will be active for the *Open Request ON Time,* then be inactive for the Open Request OFF Time 22, then repeat.
Once the target is removed, the Door Open Request will remain active for the *Open Request ON Time*.

See Parameters Window 10 for control location.

The Purpose of the *Open Request OFF Time* is to accomodate PLCs that require transistions on the Door Open Request signal in order to keep the door open.

5.2.4.9 Open Request OFF Time

Open Request OFF Time is the time the Door Open Request will be forced inactive even if a target is present.

See Open Request ON Time 22 for usage details.

The Purpose of the *Open Request OFF Time* is to accomodate PLCs that require transistions on the Door Open Request signal in order to keep the door open.

Allowable Range: Min = 0, Default = 0, Max = 2 (Seconds)

See Parameters Window 10 for control location.

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5.2.5 Controller

5.2.5.1 Get from RAM

Clicking the ***Get from RAM*** button populates the LPS, MSU, and RPS boxes with the values presently in use by the CLASS™ controller (stored in its RAM).

See Parameters Window 10 for control location.

5.2.5.2 Save to EEPROM

Clicking the ***Save to EEPROM*** button allows saving all standard parameters to the CLASS™ EEPROM.

Note:

- **This is NOT the same as clicking *Save to EEPROM* on the Advanced *Parameters* window.**
- **Each set of parameters must be saved from its own window**
- **ALWAYS save Advanced Parameters first, then Parameters.**
- **The *Save To EEPROM* function may not be available on all versions of the CLASS™ Diagnostic**

A warning (shown below) will be displayed to allow confirming or canceling the save operation.

NOTE: Clicking the *Save to EEPROM* does not "reset" the CLASS™ controller and therefore the values, although saved in EEPROM, do not replace the values currently in use by the CLASS™ controller (in CLASS™ RAM.)

To use the newly saved values, click the Reset Controller 23 button.

See Parameters Window 10 for control location.

5.2.5.3 Reset Controller

Clicking ***Reset Controller*** will reset the CLASS™ controller. This will cause the Built In Tests (Bit) 46 to be run and new targets to be acquired.

See Parameters Window 10 for control location.

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(*Reset Controller* also found at Advanced Parameters 26, Controller Programming Window 48, and BIT Window 46)

5.2.6 PC

5.2.6.1 Load Default File

Clicking ***Load Default File*** loads the values from the default file ("Default.sav") as parameter values in the laptop diagnostic.

Note that advanced parameters must be loaded from the *Advanced Parameters* window, not the *Parameters* window.

See Parameters Window 10 for control location.

5.2.6.2 Quick Save File

Clicking ***Quick Save File*** saves the current parameter values to the default file ("Quicksave.sav")

See Parameters Window 10 for control location.

5.2.6.3 Load from File

Clicking ***Load from File*** allows the user to select a file whose values will be loaded as parameter values in the laptop diagnostic for editing and/or saving to the CLASS™ controller.

Note this will only load *Parameters*, not *Advanced Parameters*.
Advanced Parameters must be loaded separately by using Load From File 38 in the *Advanced Parameters* 26 window.

See Parameters Window 10 for control location.

5.2.6.4 Save to File

Clicking ***Save to File*** allows the user to create and/or select a file in which current parameter values will be saved.

Note:

- **This is NOT the same as clicking *Save to File* 39 on the *Advanced Parameters* window.**
- **Each set of parameters must be saved from its own window**

See Parameters Window 10 for control location.

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5.2.6.5 Verify from File

Clicking

will compare the parameters visible in the *Parameters* window with those of any user-selected parameters file. Any parameters which differ will be highlighted in red.

Note that any red-highlighted parameters will remain highlighted until correctly verified.

A suggested use is as follows:
1. Load a file
2. Save to EEPROM
3. Reset Controller
4. Verify against same file

Any differences will be highlighted, allowing verification of desired programming.

See Parameters Window 10 for control location.

NOTE:
Verify from File will only work correctly if the file was saved with the same version of the CLASS diagnostic that is being used to perform the verify. If the file was saved with a different version, multiple verify errors will occur.

To avoid those errors:
1. Use Load from File 24 to load the file to be compared to.
2. Use Save to File 24 and save a copy of the file. The copy will now be the correct version.
3. Reset the controller to re-load the programmed configuration.
4. Use *Verify from File* and select the copy saved in step 2.

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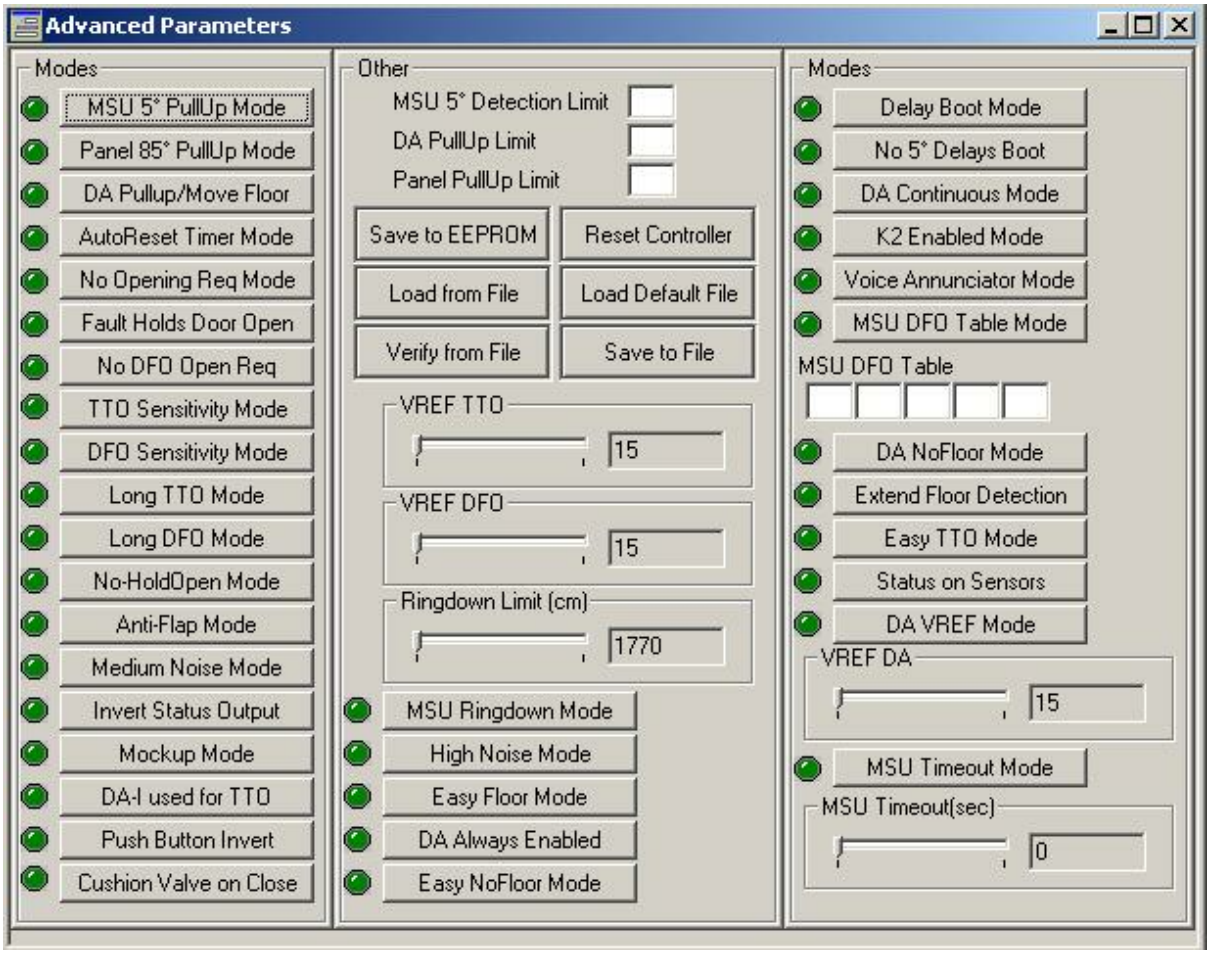
5.3 Advanced Parameters

To select and use the ***Advanced Parameters Window***, see Controls Window 5 or use the button (see Toolbar Buttons) 4.



5.3.1 Modes

To temporarily activate any Mode, use the appropriate Mode Button to enable that mode.

Note: The mode will remain enabled until the CLASS controller is turned off.

To permanently activate a mode, enable the mode with the appropriate Mode button.

Then use

to permanently store that setting.

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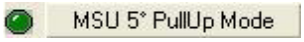
5.3.1.1 MSU 5° Pullup Mode

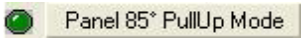
If  is enabled, when the door operator's 5º switch is active, the MSU will not detect targets beyond the *MSU 5º Detection Limit*. Also, during calibration, targets beyond the *MSU 5º Detection Limit* are not added to the table.

Enter the desired detection limit in centimeters.

Usage: useful when there are MSU targets which are seen only when the door is nearly closed. Similar to MSU Target Reduction 80, but active only when nearly closed.

See Advanced Parameters 26 for control location.

5.3.1.2 Panel 85° Pullup Mode

If  is enabled, when the door is not in the full open position, Panel sensors will not detect targets beyond the *Panel Pullup Limit*. Also, during calibration, targets beyond the *Panel Pullup Limit* are not added to the table.

Enter the desired detection limit in centimeters

Usage: useful when a panel sensor sees a target only when the door is not fully open.

See Advanced Parameters 26 for control location.

5.3.1.3 DA Pullup/Move Floor

When is enabled, the distance from the MSU to the floor is allowed to be changed during normal operation by the *Drunk Alarm* input.

Operation: when the *Drunk Alarm* input is high, and the system is IDLE, CLASS™ changes the Floor value (the first MSU entry) to the *DA PullUp Limit*. When the *Drunk Alarm* input is low, and the system is IDLE, the floor reverts to its original value. The *Drunk Alarm* input can be inverted with the Push Button Invert option. Note the *Drunk Alarm* input is redefined for this usage when this option is enabled. Enable *Drunk Alarm Always ON* if Drunk Alarm functionality is desired.

Usage: vehicles with extendable platforms (which change floor distances)

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See Advanced Parameters 26 for control location.

5.3.1.4 Auto Reset Timer Mode

When AutoReset Timer Mode is enabled, the CLASS™ controller will automatically Reset 47 (and thus re-learn any new targets) on a timed basis.

Operation: 24 hours from the previous reset, CLASS™ verifies that the doors are closed, and checks to see if the doorway is clear by looking for targets. If the doors are closed and there are no targets over a one-minute period, CLASS™ will Reset. If there are targets or the door is not closed, CLASS™ waits 10 minutes and then retries. This repeats until successful.

Usage: for systems in which CLASS™ power is infrequently turned off (such as LRVs).

See Advanced Parameters 26 for control location.

5.3.1.5 No Opening Req Mode

When No Opening Req Mode is enabled, CLASS™ will not request the door to open in the Door is Opening State.

Usage: For driver controlled CLASS™ systems in which *5º Enables CLASS™* is in use and the standard Enable input (*ENA* or */ENA*) is not being used (no external wiring connection to that input).

See Advanced Parameters 26 for control location.

5.3.1.6 Fault Holds Door Open

When Fault Holds Door Open is enabled, any BIT 78 fault (on power-up or Reset 47) will cause CLASS™ to activate all Door Open Request outputs. These will stay active until the next Reset.

Usage: most useful on multi-door vehicles (such as LRVs) as an easily visible fault indication.

See Advanced Parameters 26 for control location.

5.3.1.7 No DFO Open Req

When No DFO Open Req is enabled, CLASS will not activate the OPN or /OPN outputs while the door is fully open.

This is typically used with No Opening Req Mode 28 and is used for driver-controlled

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doors.

5.3.1.8 TTO Sensitivity Mode

When TTO Sensitivity Mode is enabled, when the door is the TTO state the sensitivity threshold will change from VREF Normal 77 to VREF TTO. The sensitivity threshold changes back to VREF Normal in other states.

Use the slider to increase the VREF TTO as necessary.

Usage: allows increased sensitivity to TTO.

See Advanced Parameters 26 for control location.

5.3.1.9 DFO Sensitivity Mode

When DFO Sensitivity Mode is enabled, when the door is the fully open the sensitivity threshold will change from VREF Normal 77 to VREF DFO. The sensitivity threshold changes back to VREF Normal in other states.

Use the slider to increase the VREF DFO as necessary.

Usage: allows increased sensitivity at DFO.

See Advanced Parameters 26 for control location.

5.3.1.10 Long TTO Mode

When Long TTO Mode is enabled, CLASS™ will allow continuous energization of its sensors in the TTO (Touch-To-Open) state for two minutes. After that time, the appropriate sensors will be energized in *LowDuty-Cycle Mode*. Once the door starts to open, CLASS™ will resume normal continuous energization of its sensors.

Note that when the sensors are in the reduced duty-cycle mode, detection of a target may require 2 to 3 seconds.

Usage: increases operating life of CLASS™ sensors when the door is enabled for long periods.

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See Advanced Parameters 26 for control location.

5.3.1.11 Long DFO Mode

When is enabled, CLASS™ will allow continuous energization of its sensors in the DFO (Door Fully Open) state for 30 seconds (as long as no targets are detected). After that time, the appropriate sensors will be energized in *Low Duty-Cycle Mode*. If a target is detected or the door starts to close, CLASS™ will resume normal continuous energization of its sensors.

Usage: increases operating life of CLASS™ sensors when the door is held open for long periods.

See Advanced Parameters 26 for control location.

5.3.1.12 No HoldOpen Mode

When is enabled, if a target is continuously detected by the MSU for ½ second, the MSU will then ignore the target for 3 seconds while the door is closing.

Usage: allows the door to “nudge” obstructions in an attempt to close.

See Advanced Parameters 26 for control location.

5.3.1.13 Anti-Flap Mode

NOTE: this feature is not finalized. Use with caution.

When is enabled, the following occurs while the door is closing:

- If a target is detected that causes the door to re-open, the target's location (both distance and time from door fully open) is stored.
- On subsequent closings, if a target having the same location is detected several times in a row, the target will then be ignored until the door closes.

See Advanced Parameters 26 for control location.

5.3.1.14 Medium Noise Mode

Enabling changes the algorithm used for boot-up target acquisition.

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Normally, a target seen at any 1 of 4 tries is added to the table. With Medium Noise Mode on, a target must be seen at the same place 2 times out of 4 tries. This helps ensure that the target is a "real" target and not generated by random noise.

See Advanced Parameters 26 for control location.

5.3.1.15 Invert Status Output

When Invert Status Output is enabled, the /STA output will be ON when CLASS has no BIT failures and OFF when there is a BIT failure.

This is inverted from typical operation.

It may be used for PLC monitoring of CLASS' status as the /STA output will only be ON when two conditions are mett:

1. CLASS is powered up
2. CLASS has no BIT failure

5.3.1.16 Mockup Mode

Mockup Mode is for use ONLY with a standalone CLASS™ controller mockup.

This mode uses CLASS™ outputs to drive white and green lights.

**** Do not use Mockup Mode on transit vehicles. ****

See Advanced Parameters 26 for control location.

5.3.1.17 DA-I used for TTO

When DA-I used for TTO is enabled, activating the Drunk Alarm input (either *DAI* or */DAI*) will cause the CLASS™ controller to issue a door open request.

Usage: allows reconfiguring the Drunk Alarm input for another purpose (typically push-button door open for a Mockup).

Enable *Drunk Alarm Always ON* if Drunk Alarm functionality is desired.

See Advanced Parameters 26 for control location.

5.3.1.18 PushButton Invert

When Push Button Invert is enabled, the Drunk Alarm Inputs are inverted in software.

Usage: typically used for a Mockup.

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See Advanced Parameters 26 for control location.

5.3.1.19 Cushion Valve On Close

When Cushion Valve on Close is enabled, the normal function of the /OPN output is changed so that the /OPN output is turned ON while the door is closing; the /OPN output is turned off when the door closes or recycles.

This mode is used where required to activate a cushion valve to reduce closing force.

5.3.1.20 MSU Ringdown Mode

Enabling MSU Ringdown Mode will allow increasing the distance allowed for the MSU to "Ring Down".

The default ringdown lockout distance (the distance from the face of the MSU over which the MSU ECHO will be ignored) is approximately 30 cm (which corresponds to a distance of 1.75 milliseconds).

Use the slider to increase the lockout distance as necessary. Adjustment range is from 30 cm (1.77 mSec) to 45 cm (2.655 mSec)

To find a desired time (mSec) from a known distance, multiply the distance (in cm) by 0.059 (or 59÷1000).

See Advanced Parameters 26 for control location.

Usage: This should be used when the MSU *SEND* signal takes longer to "ring down", or decay, than usual, which may cause erroneous detection of targets (typically in the 30 - 40 centimeter region). In other words, it prevents the MSU from “seeing itself” as a target due to long ringdown times.

5.3.1.21 High Noise Mode

Enabling High Noise Mode mode changes the power-up calibration sequence so that learned targets must be seen in 3 of 4 pulses (similar to normal mode) instead of 1 of 4 pulses. This mode also widens the tolerance within which the floor must be seen.

Usage: This mode provides increased random-noise rejection and makes it easier for sensors to “see” the floor, especially in a high-noise environment

See Advanced Parameters 26 for control location..

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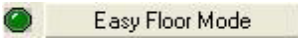
5.3.1.22 Easy Floor Mode

When 

is enabled, if a sensor sees any target or objects (not just the floor), that sensor will pass its sensor test. Note this includes targets already in the target table.

Usage: useful when using *High Noise Mode* to avoid erroneous sensor failures.

See Advanced Parameters 26 for control location.

5.3.1.23 DA Always Enabled

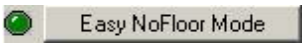
Typically, the ***Drunk Alarm*** function must be hardware enabled by connecting the appropriate signal to *DA-I* or */DA-I* at the CLASS input connector. Once hardware-enabled, the Drunk Alarm functionality can be controlled by the diagnostic settings.

Enabling

eliminates the need to connect the DAI or /DAI input to enable the Drunk Alarm function, and thus allows the use of the DAI or /DAI input for other functionality. Note that the Drunk Alarm function may still be enabled or disabled by use of the CLASS™ Diagnostic software.

See Advanced Parameters 26 for control location.

5.3.1.24 Easy NoFloor Mode

When 

is enabled, any fixed target seen (even if the target is not the floor) will stop a "NoFloor" detect (i.e., No Door Open Request will be generated).

This may be used to allow use of NoFloor under conditions not previously suitable. For example, it is possible when using this mode that *No Floor DFO - Panels* or *No Floor Closing - Panels* may be used with a swing door, assuming there are well-seen fixed targets as part of the door panels. The installer must be aware of usage limitations (for example, if there are no fixed targets, this mode will not be of use).

CAUTION: THIS MODE MUST BE THOROUGHLY TESTED BY THE INSTALLER BEFORE USE.

5.3.1.25 Delay Boot Mode

Activating ***Delay Boot Mode*** will cause the boot process to be delayed by 10 seconds from any power-up or Reset.

Usage:
This allows avoiding typical Hybrid Bus electrical "noise" on vehicle startup.

Tip:

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When using CLASS™ Diagnostics while the bus is running, turn off *Delay Boot Mode* to avoid Reset delays.
Remember to turn it back on when CLASS™ setup is complete.

Note:
Delay Boot Mode may be used in conjunction with No 5° Delays Boot 34;
in that case the delay will occur first, then the door-closed status will be appraised.

5.3.1.26 No 5° Delays Boot

Activating ***No 5° Delays Boot*** will cause the CLASS™ controller to wait for a door-closed indication before booting.

Usage:
Avoids annoyance caused by buses which have a continuous buzzer when CLASS™ fails turn-on BIT 78

Note:
No 5° Delays Boot may be used in conjunction with Delay Boot Mode 33;
in that case the delay will occur first, then the door-closed status will be appraised.

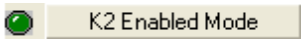
5.3.1.27 DA Continuous Mode

When ***DA Continuous Mode*** is active, the Drunk Alarm 18 activation will be continuous instead of being activated for short bursts at recurring intervals.

Usage:
Provides faster *Drunk Alarm* response.

5.3.1.28 K2 Enabled Mode

As of version 3.29, the default state of K2 is disabled.

To enable use of K2, use the 

button.

(K2 is typically used only on slide-glide doors to to override the 5° switch to allow CLASS a short time to ensure the door is clear prior to the bus releasing interlock.)

5.3.1.29 Voice Annunciator Mode

Activating ***Voice Annunciator Mode:***
- enables Voice Annunciator Parameters 60
- redefines DrunkAlarmOut, Recycle, and /Recycle outputs for use with the Voice Annunciator

If ***Voice Annunciator Mode*** is not active, Voice Annunciator Parameters 60 settings

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have no affect.

5.3.1.30 MSU DFO Table Mode

MSU DFO Table Mode is used to provide a separate target table for the MSU which will be active only when the door is fully open. When *MSU DFO Table Mode* is active, the MSU's normal target table is temporarily replaced by the MSU DFO Table, but only during the time the door is at DFO.

This mode may be used to reduce MSU dead zones caused by objects which are:

1. Not seen when the door is fully open
2. Typically higher than a normal MSU Detection Limit 12.

Examples are door grab handles, window ledges, etc.

To use *MSU DFO Table Mode,* fill in the appropriate values in the MSU DFO Table

on the Advanced Parameters screen.

Although the MSU DFO Table only has 5 targets, all the conditions listed in General Notes 11 apply.

If objects are lower than the normal MSU Detection Limit, MSU Target Reduction 80 may be used instead.

5.3.1.31 DA NoFloor Mode

When *DA NoFloor Mode* is active, any sensors which are being used in Drunk Alarm Mode 1 will consider the absence of an echo from the floor as a valid Drunk Alarm detection.

See also No Floor TTO 16, No Floor DFO Mode 16,
No Floor Closing Mode 17, No Floor Mode - Full 89,
and No Floor Mode - MSU 90 for other *NoFloor* modes.

5.3.1.32 Extend Floor Detection

When

is enabled, the floor detection algorithm used during boot-up is modified as follows:

1. V_{REF} is temporarily set to 0.5V
2. Up to 3 tries (as necessary) are made to find the floor
3. No new targets are added during re-tries

This mode may be used with Easy Floor and also with either Noise mode.

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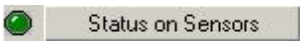
5.3.1.33 Easy TTO Mode

changes the target detection algorithm used in the TTO state only by requiring only two detects out of 4 (instead of the normal 3 out of 4).

This makes it easier to detect passengers in the TTO state.

5.3.1.34 Status On Sensors

When 

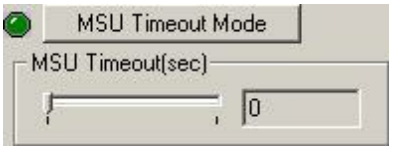
is turned on, if a sensor fails its BIT test during boot-up, that sensor's LED will be RED for a short time to visually indicate which sensor caused the BIT failure.

5.3.1.35 DA VREF Mode

This is used to turn on the DA VREF Mode, which, when enabled, allows independent setting of the VREF used in Drunk Alarm target detection. This alternate VREF is in use ONLY while in the Drunk Alarm state.

The VREF value (in Volts) is set by use of the slider control.

5.3.1.36 MSU Timeout Mode



Enabling *MSU Timeout Mode* will allow the door to close after a set time as follows:

If the MSU is holding the door open, after [MSU Timeout] seconds the MSU will be ignored, allowing the door to attempt to close.

The panel sensors will still operate as normal.

The time (in seconds) that the MSU is allowed to hold the door open (before being ignored) is set in the MSU Timeout (Sec) slider control.

5.3.2 Controller

5.3.2.1 Save to EEPROM

Clicking the ***Save to EEPROM*** button allows saving all advanced parameters to the CLASS™ EEPROM.

Note:

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- **This is NOT the same as clicking *Save to EEPROM* on the *Parameters* window.**
- **Each set of parameters must be saved from its own window.**
- **ALWAYS save Advanced Parameters first, then Parameters.**
- **The *Save To EEPROM* function may not be available on all versions of the CLASS™ Diagnostic**

A warning (shown below) will be displayed to allow confirming or canceling the save operation.

NOTE: Clicking the *Save to EEPROM* does not "reset" the CLASS™ controller and therefore the values, although saved in EEPROM, do not replace the values currently in use by the CLASS™ controller (in CLASS™ RAM.)

To use the newly saved values, click the Reset Controller 23 button.

See Advanced Parameters 26 for control location.

5.3.2.2 Reset Controller

Clicking [Reset Controller] will reset the CLASS™ controller. This will cause the Built In Tests (Bit) 46 to be run and new targets to be acquired.

See Advanced Parameters 26 for control location.

(*Reset Controller* also found at Parameters Window 10, Controller Programming Window 48, and BIT Window 46)

5.3.3 PC

5.3.3.1 Load Default File

Clicking [Load Default File] loads the advanced parameter values from the advanced parameter default file ("ADVDefault.sav") as advanced parameter values in the laptop diagnostic.

Note that standard parameters must be loaded from the *Parameters* window, not the *Advanced Parameters* window.

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See Advanced Parameters 26 for control location.

5.3.3.2 Load From File

Clicking Load from File allows the user to select a file whose values will be loaded as advanced parameter values in the laptop diagnostic for editing and/or saving to the CLASS™ controller.

Note this will only load *Advanced Parameters*, not *Parameters*.
Parameters must be loaded separately by using Load From File 87 in the Parameters 10 window.

See Advanced Parameters 26 for control location.

5.3.3.3 Verify From File

Clicking Verify from File will compare the parameters visible in the *Advanced Parameters* window with those of any user-selected parameters file. Any parameters which differ will be highlighted in red.

Note that any red-highlighted parameters will remain highlighted until correctly verified.

A suggested use is as follows:
1. Load a file
2. Save to EEPROM
3. Reset Controller
4. Verify against same file

Any differences will be highlighted, allowing verification of desired programming.

See Advanced Parameters 26 for control location.

NOTE:
Verify from File will only work correctly if the file was saved with the same version of the CLASS diagnostic that is being used to perform the verify. If the file was saved with a different version, multiple verify errors will occur.

To avoid those errors:
1. Use Load from File 38 to load the file to be compared to.
2. Use Save to File 39 and save a copy of the file. The copy will now be the correct version.
3. Reset the controller to re-load the programmed configuration.
4. Use *Verify from File* and select the copy saved in step 2.

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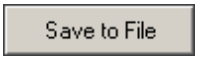
5.3.3.4 Save to File

Clicking 

allows the user to create and/or select a file in which current advanced parameter values will be saved.

Note:

- **This is NOT the same as clicking Save to File 24 on the *Parameters* window.**
- **Each set of parameters must be saved from its own window**

See Advanced Parameters 26 for control location.

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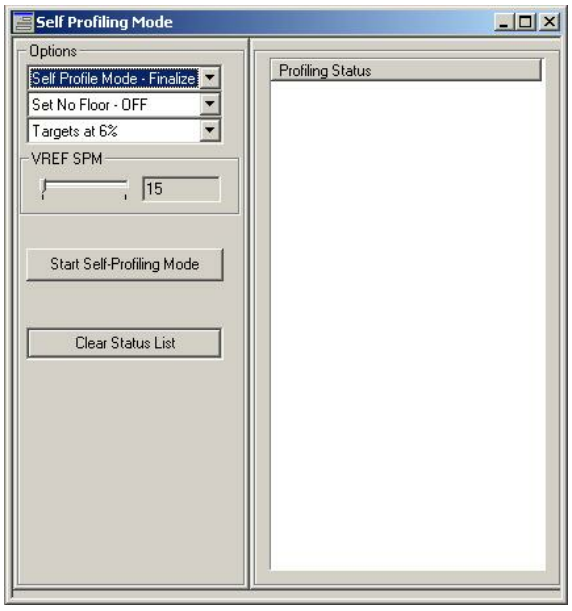
5.4 Self-Profiling Mode

Self-Profiling mode may be used to have CLASS™ find and program fixed targets semi-automatically.



To use Self-Profiling Mode:

1. Floor values, MSU Detection Limit, and Panel Limit values must be manually programmed.

2. VREF Calibration must be manually programmed.

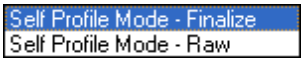
3. Door must be enabled.

Notes:

If door is driver-controlled, user must monitor Profiling Status and manually cycle doors appropriately.

If door does not auto-close, user must monitor Profiling Status and manually de-authorize and re-authorize doors appropriately.

1. Select Mode type:



Finalize: Only adds to existing programmed targets as necessary
Use to verify a manually programmed configuration,
or to customize a default configuration.

Raw: Clears all targets except Floor; adds all targets as necessary

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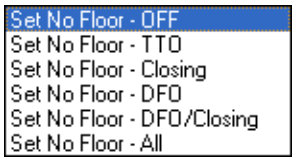
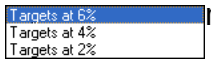
Use for new install configuration

2. Select desired NoFloor operation:

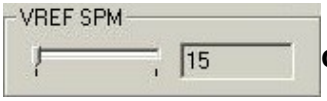


3. Select Target size:



-Use 6% for typical targets; use smaller values to find more closely-spaced targets.
-Smaller values will provide more accurate coverage for multiple targets that just barely fit in the normal 6% tolerance zone. (See Target Size Example 41)
Note this ONLY affects self-profiling. (Normal 6% will be used when running.)

4. Select VREF SPM:



-VREF SPM replaces VREF Normal 20 **only** while in Self-Profiling Mode.
-Setting a lower VREF SPM will help find more targets.
-A good starting point: set VREF SPM the same as VREF Calibration 20

5. Press

Self-Profiling mode will attempt to **cycle the doors** four times.
Detected targets will then be saved in the target table and the controller will be reset.

Use

to clear the information shown in the Profiling Status list

5.4.1 Target Size Example

Example of the difference between 6% and 2% targets in Self-Profiling Mode 40.

Assume that there for a given sensor there are fixed targets at **100** cm and **105** cm.

Fixed Targets at:	Targets found using 6%	Resulting Dead Zone (±6%)	Targets found using 2%	Resulting Dead Zone (±2%)
100 cm	100 cm	from 94 cm to 106 cm	100 cm	from 94 cm to 106 cm
105 cm			105 cm	from 98.7 cm to 111.3 cm

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		Total Dead Zone: 12 cm		Total Dead Zone: 17.3 cm

Note that, due to target overlap in the 2% case, the 2% total dead zone is larger.

However: if temperature changes cause the 105 cm target to later be detected as farther away,
and thus outside the 6% tolerance band, a false detection may occur.

As a result, although more targets and overall larger dead zones may result from using smaller target tolerances,
system reliability is significantly enhanced.

As always, the tradeoff is between overall reliability and highest perceived detection performance.

A suggested approach is to run Self-Profiling at 2% and at 6%, evaluate any differences in results, and take appropriate action.

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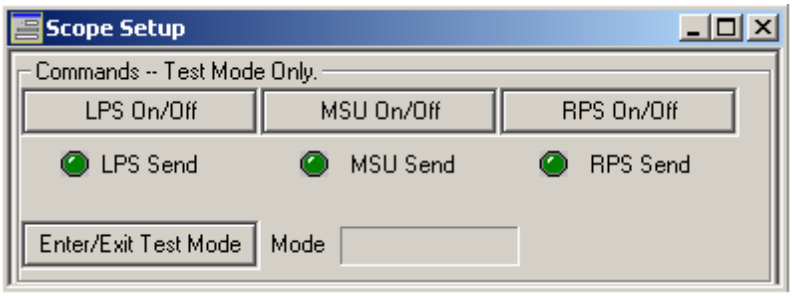
5.5 Scope Setup

5.5.1 Scope Setup Window



5.5.2 Enter/Exit Test Mode

Clicking ***Enter/Exit Test Mode*** will cause the CLASS™ controller to enter test mode (if in normal mode) or to exit test mode (if in test mode).

NOTE: Test mode can NOT be entered if the door is open.

See Scope Setup Window 43 for control location.

5.5.3 Mode

The box adjacent to ***Mode*** will indicate the active mode (*Normal* or *Test*).

See Scope Setup Window 43 for control location.

5.5.4 Sensor On/Off Buttons - General

To ensure correct operation, the On/Off buttons will only function while in Test Mode.

See Enter/Exit Test Mode 43.

See Scope Setup Window 43 for control location.

5.5.5 LPS On/Off

Click ***LPS On/Off*** to manually turn on or turn off the LPS (only while in Test Mode).

See Scope Setup Window 43 for control location.

5.5.6 MSU On/Off

Click ***MSU On/Off*** to manually turn on or turn off the MSU (only while in Test Mode).

See Scope Setup Window 43 for control location.

5.5.7 RPS On/Off

Click ***RPS On/Off*** to manually turn on or turn off the RPS (only while in Test Mode).

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See Scope Setup Window 43 for control location.

5.5.8 LPS Send

The ***LPS Send*** light will be ON when the LPS is ON.

See Scope Setup Window 43 for indicator location

5.5.9 MSU Send

The ***MSU Send*** light will be ON when the MSU is ON.

See Scope Setup Window 43 for indicator location

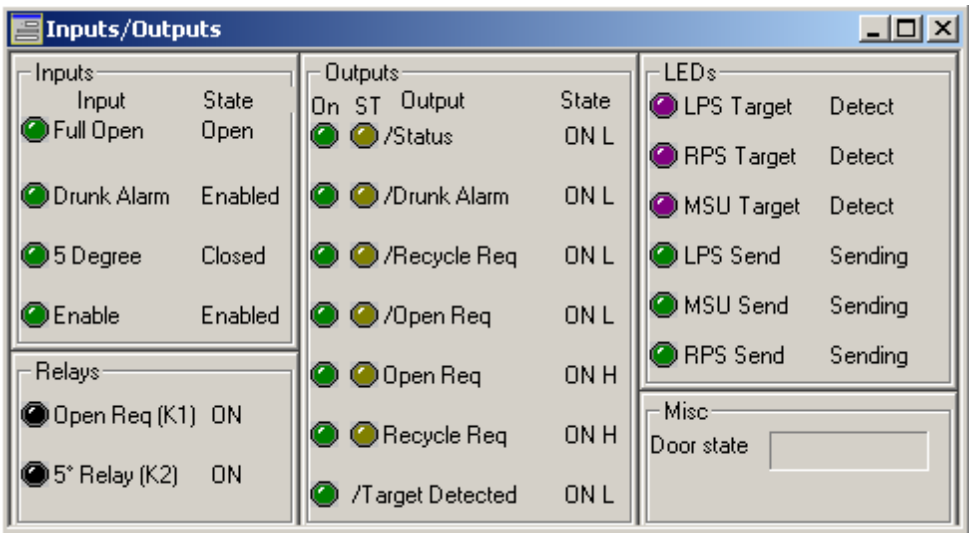
5.5.10 RPS Send

The ***RPS Send*** light will be ON when the RPS is ON.

See Scope Setup Window 43 for indicator location

5.6 Inputs/Outputs

5.6.1 Inputs/Outputs Window



5.6.2 Inputs

For each input, the light will be ON when the input is active, and OFF when not active. State will provide a descriptive word indicating the state of the input.

See Inputs/Outputs Window 44 for indicator location

5.6.3 Relays

For each relay, the light will be ON when the relay is energized, and OFF when not energized. State will provide a descriptive word indicating the state of the relay.

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See Inputs/Outputs Window 44 for indicator location

5.6.4 Outputs

For each output, the ***On*** light will be ON when the input is active, and OFF when not active. ***State*** will display ON or OFF, indicating the state of the input, followed either by ***L*** (indicating the output is LOW) or by ***H*** (indicating the output is HIGH) if the output is ON. The ***ST*** light will be ON if a problem related to the output is detected.

For outputs that are HIGH when ON, the ***ST*** light will be ON when an over-current or over-current shutdown exists.

For outputs that are LOW when ON, the ***ST*** light will be ON when an over-current or over-current shutdown exists, or when the load is disconnected.

See Inputs/Outputs Window 44 for indicator location

5.6.5 LEDs

For each LED, the light will be ON when the LED is energized, and OFF when not energized. A descriptive word indicating the state and meaning of the LED will be shown.

See Inputs/Outputs Window 44 for indicator location

5.6.6 Door State

Door State displays the current operational state of the CLASS™ controller.

See Inputs/Outputs Window 44 for indicator location

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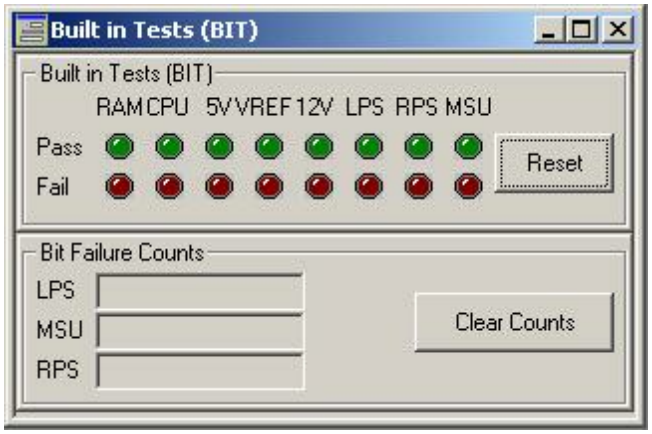
5.7 Built In Tests (BIT)

5.7.1 BIT Window



- See Built In Tests (BIT) 46 for details of each test.

- Clicking ***Reset*** will reset the CLASS™ controller, and therefore cause the Built In Tests (BIT) 46 to be run.

(*Reset Controller* also found at Parameters Window 10 and Controller Programming Window 48)

- **BIT Failure Counts**:

The number of BIT failures of each sensor will be kept until cleared.
This is useful in diagnosing the cause of an active status light.

Pressing

will clear the counts for all sensors.

5.7.2 Built In Tests (BIT)

BIT is run at CLASS™ controller turn-on. Lights indicate the Pass/Fail status of each item tested.
If ***BIT*** fails, the Status Light 1 will turn on. Also, If *No Floor* mode is active and ***BIT*** fails due to a sensor's failure to see the floor, No Floor mode will be de-activated for the sensor that failed.

Tests include:

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RAM - verifies RAM is working
CPU - verifies CPU is functional
5V - verifies internal 5V supply is within tolerance
VREF - verifies analog functionality
12V - verifies internal 12V supply is within tolerance
LPS - verifies LPS is functional (via floor detection)
RPS - verifies RPS is functional (via floor detection)
MSU - verifies MSU is functional (via floor detection)

See BIT Window 46 for indicator location

See EEPROM Status 47 for more information on diagnosing the cause of a turned-on Status Light 1.

5.7.3 Reset

Clicking ***Reset*** will reset the CLASS™ controller, and therefore cause the Built In Tests (Bit) 46 to be run.

See BIT Window 46 for control location.

(*Reset Controller* also found at Parameters Window 10 and Controller Programming Window 48)

5.8 EEPROM Status

5.8.1 EEPROM Status Window

5.8.2 EEPROM Status

EEPROM STATUS (ES) - indicates by Pass/Fail lights if the value(s) for the parameters shown are set and within Allowable Range 10.

If any parameter value is not within its allowable range, the CLASS™ controller will turn on the Status Light 1 and will use the default value for that parameter instead.

Parameters are evaluated at the time the controller is turned on or at Reset. If a parameter value is outside the allowable range, the default value will be used for programming instead. Once the value is corrected in the Parameters window and the controller is programmed and then reset, the appropriate Status Light will turn off.

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See EEPROM Status Window 47 for indicator location.

5.9 Controller Programming

5.9.1 Controller Programming Window

5.9.2 Reset Controller

Clicking ***Reset Controller*** button will reset the CLASS™ controller

See Controller Programming Window 48 for control location.

(*Reset Controller* also found at Parameters Window 10 and BIT Window 46)

5.9.3 Programming Mode

Clicking ***Programming Mode*** will enable programming of the CLASS™ controller.

Additional software is required to program the CLASS™ controller.
See CLASS Firmware Programming help for more information.

See Controller Programming Window 48 for control location.

5.9.4 Exiting Programming Mode

If the CLASS Controller is in Programming Mode, the *SYSTEM OK LED* will NOT be flashing (it will be permanently solid Red).

To take the CLASS Controller out of programming Mode:

1. Make sure CLASS Controller is OFF.
2. Run *CLASS Diag*.
3. **IMPORTANT**: Select *CLASS 2 Mode*.
4. Select Window→New Window→Software Download.

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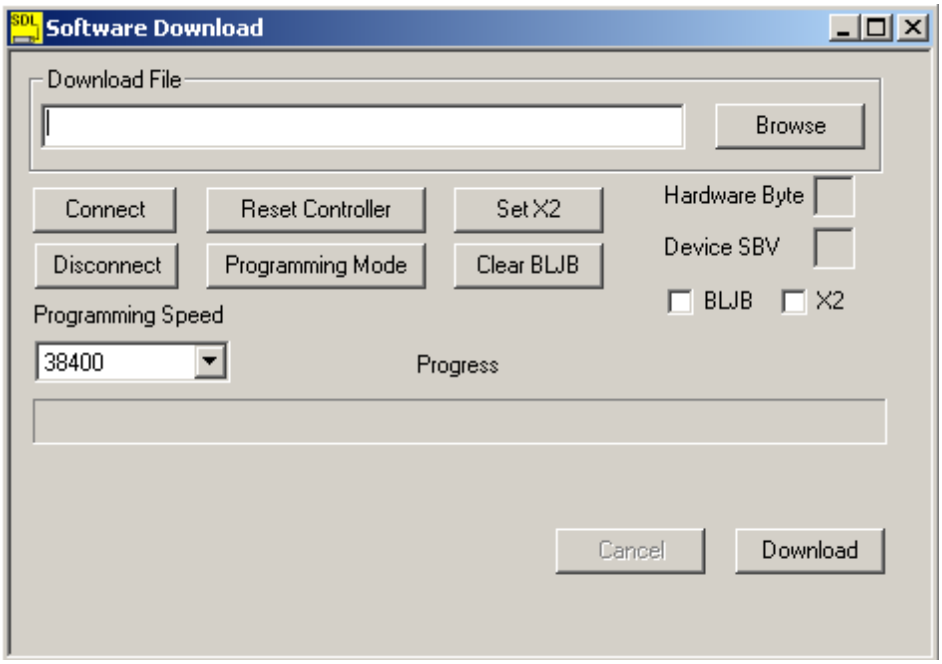

5. Turn CLASS Controller ON.
6. Push the *Connect* button. When successfully connected, a "Connected" message will appear below the Progress bar.
7. Press the *Clear BLJB* button and the *Set X2* button.
8. Close *CLASS Diag.*
9. Reset the CLASS Controller by turning it OFF and back ON.
10. Verify the *SYSTEM OK* LED on the Controller is flashing.

If this is not successful, see Stuck in Programming Mode 50.

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5.9.4.1 Stuck in Programming Mode

If a CLASS controller loses power during firmware programming, or there are communications issues which cause timeouts during firmware programming, it may be difficult to re-program the firmware using normal means, and the controller will appear to be permanently "stuck" in programming mode. If normal means have been tried to exit programming mode and they do not work, the following procedure should allow re-programming the CLASS controller firmware.

Required items:

1. Laptop Computer with built-in or external serial port
2. CLASS Adapter and network cable
3. CLASS Diagnostic
4. CLASS firmware to download to controller
5. Clip-lead type jumper wire

Steps:

1. Remove power from the controller.
2. Remove the controller board from its enclosure. (Unscrew the end with the sensor connectors and slide the board out that end. It will not slide out the other end due to component interference with the enclosure light pipes. If this is not possible, the controller may need to be removed first.)
3. Using a clip-lead jumper, connect the jumper from Pin #4 to Pin #8 of the RJ-45 connector as shown in Figure 2 below. (The pins are located on the top of the connector and are numbered 1-8 from left to right when looking down on the top of the jack and the open end of the jack is facing you. See Figure 1 below.)
4. Connect the P1 connector plug to the Class controller board, or use an external power supply to power up the board.
5. Connect your laptop to the Class controller board in the normal manner, so the network cable is plugged into the RJ-45 jack.
6. Apply power to the controller. It should power up in programming mode.
7. Run the appropriate batch file to download the CLASS firmware.

Note: If you run in to timeout issues in Step 7, disconnect power and the network cable from the controller board for 10 minutes.
Then repeat Steps 4-7.

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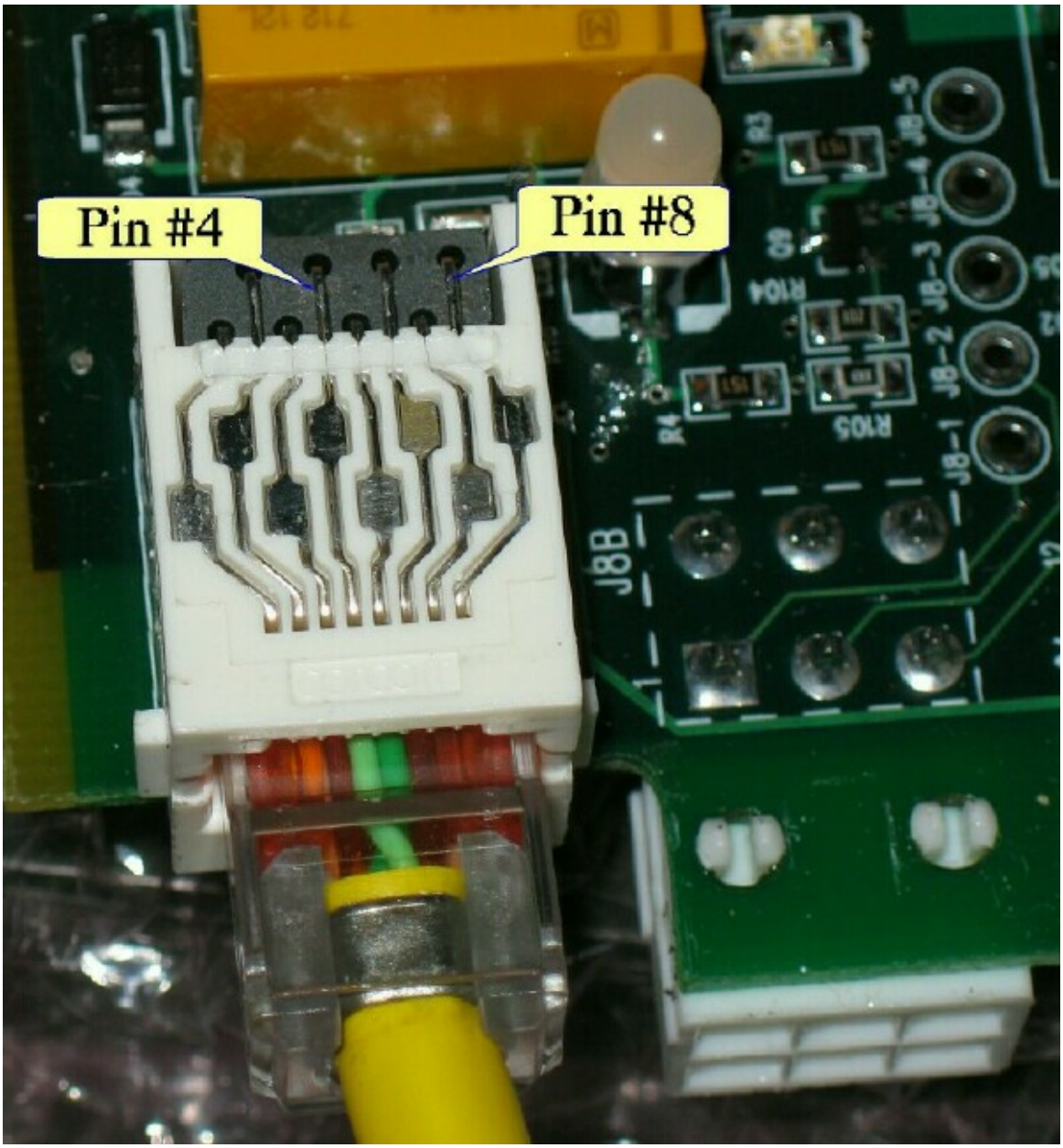

Figure 1

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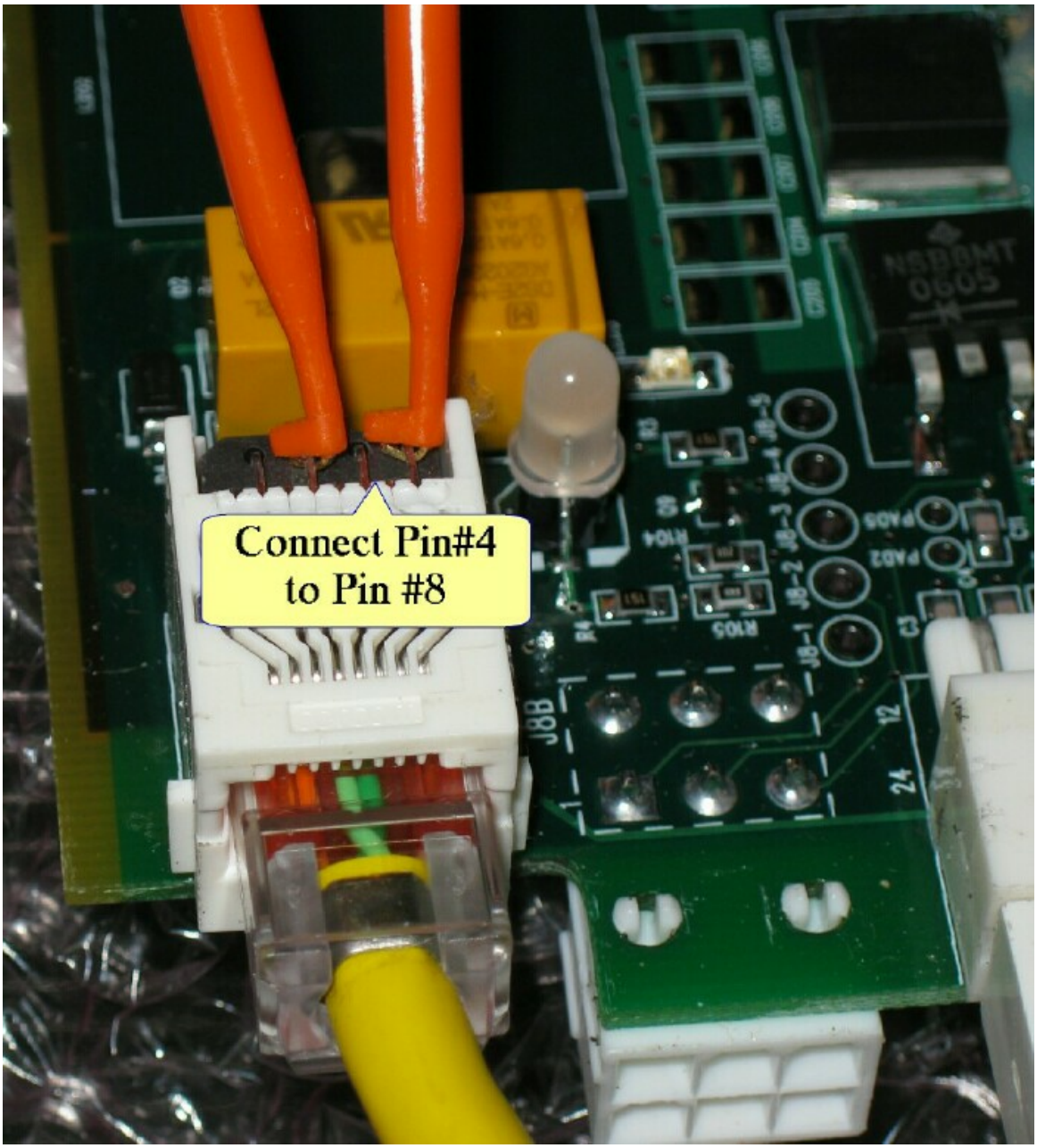

Figure 2

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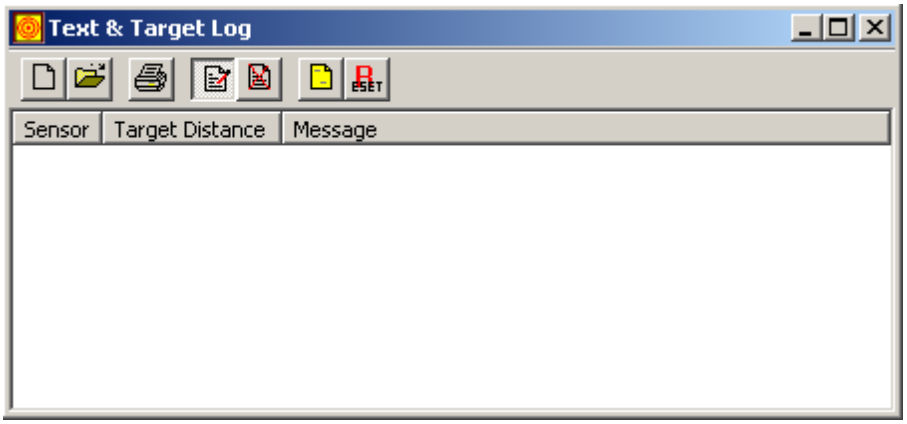
5.10 Text & Target Log

5.10.1 Text & Target Log Window



The **New** button will allow the user to open a new log file for data capture.

The **Open** button will allow the user to open any existing log file for data capture.

The **Print** button will print the contents of the Text & Target Log to an attached printer.

Pressing the **Start** button enables the logging of data. Note this button is automatically pressed when the *Text & Target Log* is opened. (Minimizing or restoring the T*ext & Target Log* will not change the state of the button.)

Pressing the **Stop** button disables the logging of data.

Pressing the **Clear** button erases any data in the *Text & Target Log*. Note that pressing the **Clear** button does not change whether data logging is enabled or disabled.

The **Reset** button performs the Reset Controller 23 function.

The T*ext & Target Log* window can be resized as desired.

5.10.2 General Usage

The ***Text & Target Log*** contains three types of information:

- various system status messages,
- messages generated when Periodic Report 14 is active, and
- sensor and target distance information when either Periodic Report 14 is active or when Target Reporting 14 is active.

As messages are received, they are "pushed" downwards; the most recent message is at the top.

See Text & Target Log Window 53 for data location

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5.10.3 Sensor

The ***Sensor*** column indicates which sensor received a target echo, or displays TXT for a text message.

See Text & Target Log Window 53 for data location

5.10.4 Target Distance

The ***Target Distance*** column indicates the calculated distance to the target.

See Text & Target Log Window 53 for data location

5.10.5 Message

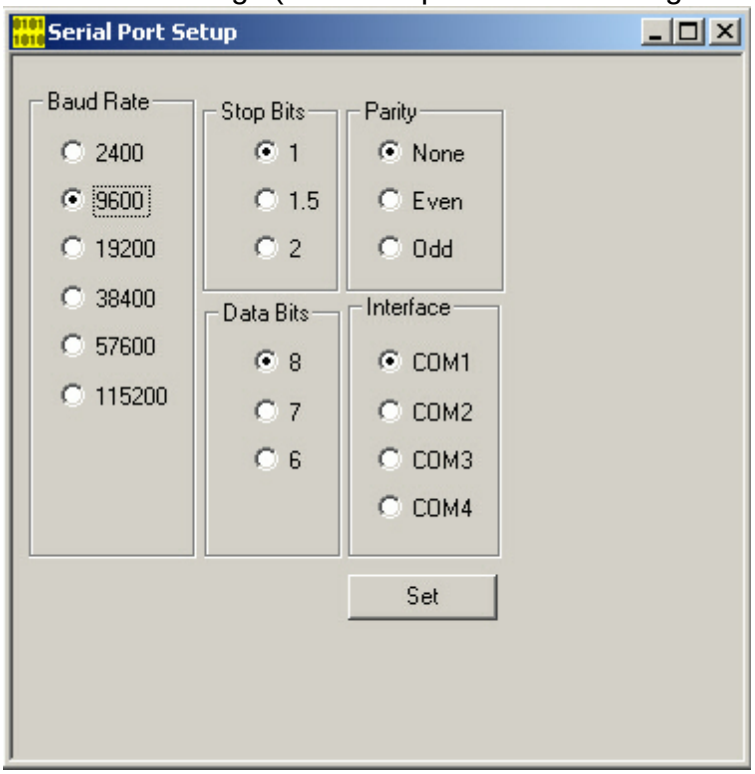
The ***Message*** column contains system status messages.

See Text & Target Log Window 53 for data location

5.11 Serial Port Setup

5.11.1 Setup

Serial Port settings (Set COM port based on diagnostic computer):



Settings shown are for CLASS 3.

For CLASS 2:
- set Baud Rate to 19200

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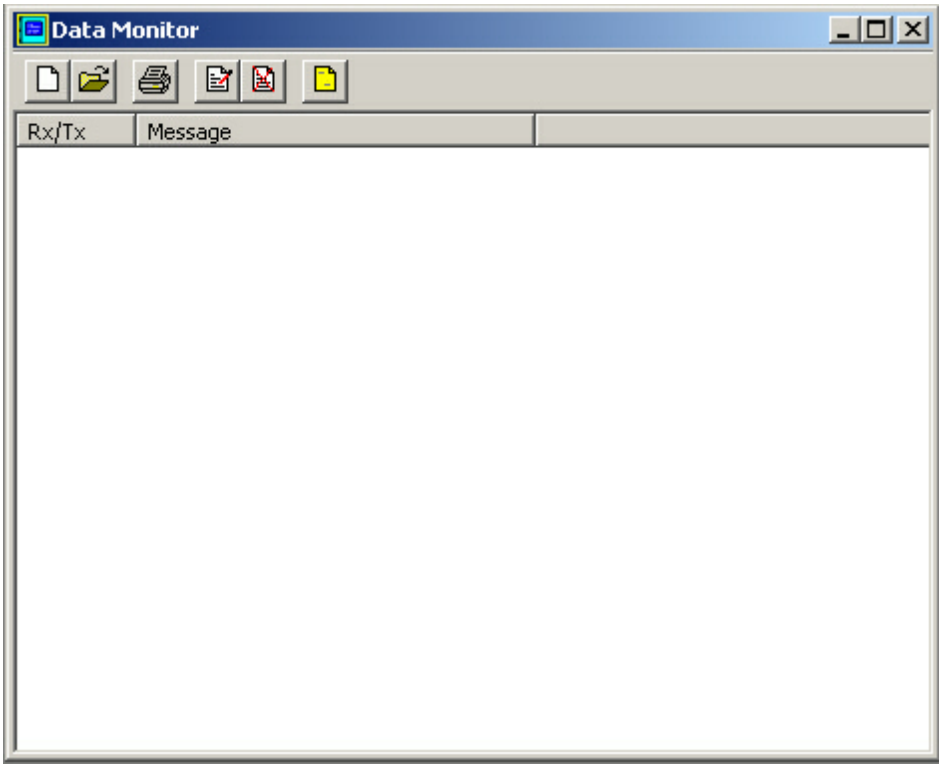
- click "Set"
(These settings are normally applied automatically
when the CLASS 2 Mode Button 2 is clicked.)

5.12 Data Monitor

5.12.1 Data Monitor Window



5.12.2 Capabilities

The ***Data Monitor*** is intended ONLY for advanced troubleshooting. (Use of the *Data Monitor* will have no affect on the CLASS™ controller.) The *Data Monitor* includes two columns: *Rx/Tx* and *Message*.

As messages are received, they are "pushed" downwards; the most recent message is at the top.

Rx/Tx column - indicates the "direction" of data from the diagnostic computer's point of view. *Rx* indicates data received by the diagnostic computer; *Tx* indicates data sent by the diagnostic computer.

Message column - will contain the raw serial data sent or received by the diagnostic computer. An explanation of the message syntax is beyond the scope of this description.

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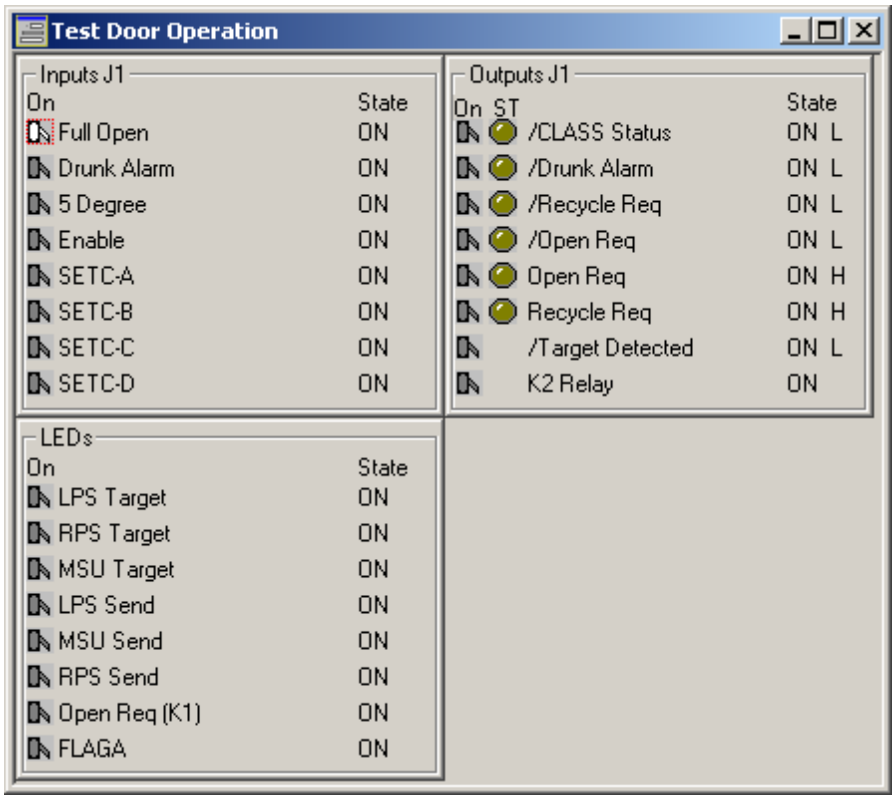
See Data Monitor Window 55 for data location

5.13 Test Door Operation

5.13.1 Test Door Operation Window



NOTE: The ***Test Door Operation*** window is intended ONLY for advanced troubleshooting, and is not included in the standard diagnostic.

Usage - for each Input, Output, and LED:

- Clicking the "switch" icon to the left of the item name will toggle the item ON or OFF.
- The switch indicates the ON/OFF state of the item: Up indicates ON, down indicates OFF.
- The STATE column will also indicate the ON/OFF state of the item and whether the item is L (Low) or H (High).
- The ST light indicates any problems detected on the solid-state outputs (shorted output, open load, etc)

See Test Door Operation Window 56 for control location.

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5.14 PC & Timers

5.14.1 Save to EEPROM

Clicking the ***Save to EEPROM*** button allows saving all Voice Annunciator parameters to the CLASS™ EEPROM.

Note:

- **This is NOT the same as clicking *Save to EEPROM* on the Standard or Advanced *Parameters* windows.**
- **Each set of parameters must be saved from its own window**
- **The *Save To EEPROM* function may not be available on all versions of the CLASS™ Diagnostic**

A warning (shown below) will be displayed to allow confirming or canceling the save operation.

NOTE: Clicking the *Save to EEPROM* does not "reset" the CLASS™ controller and therefore the values, although saved in EEPROM, do not replace the values currently in use by the CLASS™ controller (in CLASS™ RAM.)

To use the newly saved values, click the Reset Controller 23 button.

See Voice Annunciator Parameters 60 for control location.

5.14.2 Load from File

Clicking

allows the user to select a file whose values will be loaded as Voice Annunciator parameter values in the laptop diagnostic for editing and/or saving to the CLASS™ controller.

Note this will only load *Voice Annunciator Parameters*, not *Advanced Parameters or Parameters*.
Parameters and *Advanced Parameters* must be loaded separately by using Load From File 87 in the Parameters 10 or Advanced Parameters 26 window.

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See Voice Annunciator Parameters 60 for control location.

5.14.3 Verify from File

Clicking Verify from File will compare the parameters visible in the Voice Annunciator Parameters 60 window with those of any user-selected parameters file. Any parameters which differ will be highlighted in red.

Note that any red-highlighted parameters will remain highlighted until correctly verified.

A suggested use is as follows:
1. Load a file
2. Save to EEPROM
3. Reset Controller
4. Verify against same file

Any differences will be highlighted, allowing verification of desired programming.

See Voice Annunciator Parameters 60 for control location.

NOTE:
Verify from File will only work correctly if the file was saved with the same version of the CLASS diagnostic that is being used to perform the verify. If the file was saved with a different version, multiple verify errors will occur.

To avoid those errors:
1. Use Load from File 38 to load the file to be compared to.
2. Use Save to File 39 and save a copy of the file. The copy will now be the correct version.
3. Reset the controller to re-load the programmed configuration.
4. Use *Verify from File* and select the copy saved in step 2.

5.14.4 Reset Controller

Clicking Reset Controller will reset the CLASS™ controller

See Voice Annunciator Parameters 60 for control location.

(*Reset Controller* also found at Parameters Window 10, Advanced Parameters 26 window, and BIT Window 46)

5.14.5 Load Default File

Clicking Load Default File loads the Voice Annunciator parameter values from the Voice Annunciator default parameter file ("VADefault.sav") as advanced parameter values in

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the laptop diagnostic.

Note that standard and advanced parameters must be loaded from the *Parameters* window and *Advanced Parameters* window.

See Voice Annunciator Parameters 60 for control location.

5.14.6 Save to File

Clicking

allows the user to create and/or select a file in which current Voice Annunciator parameter values will be saved.

Note:

- **This is NOT the same as clicking Save to File 24 on the *Parameters* or Advanced Parameters window.**
- **Each set of parameters must be saved from its own window**

See Voice Annunciator Parameters 60 for control location.

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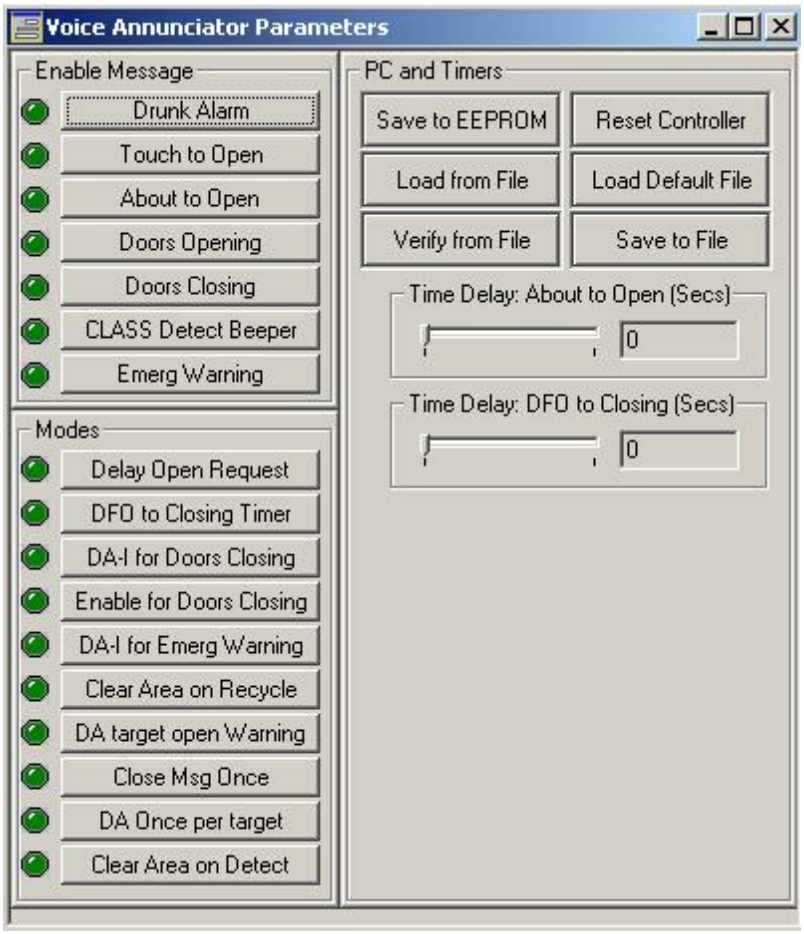
5.15 Voice Annunciator Parameters



Enable Message: see Enable Message 61

Modes: see Modes 61

PC & Timers: see individual topics (click on button)

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5.15.1 Enable Message

Each ***Enable Message*** button, when active, allows the CLASS controller to send a message trigger to the Voice Annunciator for the specific event.

The ***Enable Message*** buttons and default operations are:

Message Button	*Default Trigger Event*
Drunk Alarm	When a Drunk Alarm 18 detection occurs
Touch to Open	CLASS becomes Enabled (*ENA* activated)
About to Open	CLASS receives Touch-To-Open (TTO) request
Doors Opening	Door Open Request issued when doors are closed
Doors Closing	Loss of DFO (Door Fully Open)
CLASS Detect	Detection of any CLASS target (use for testing)
Emergency Warning	Activation of Emergency (via *DA-I*)

5.15.2 Modes

The Mode buttons control message-triggering options. These options are not required. If no Modes are activated, default operation will occur (see Enable Message 61 for defaults).

- The first mode provides an option for the "Door is About to Open" message:

Activating Delay Open Request allows setting timer *Time Delay: About to Open (Secs).*

When a passenger door-open-request is received, the "Door is About to Open" message is triggered and the timer starts.
When the timer ends, the door-open-request to the bus is activated.

- The next three modes provide options for triggering the "Door is Closing" message.
  Note: Do not select more than one of the following three options.

Activating DFO to Closing Timer allows setting timer *Time Delay: DFO to Closing (Secs).*
The timer starts when the door reaches DFO (fully open); when the timer ends the message is triggered.

Activating Enable for Doors Closing will trigger a message when the *ENA* input is de-activated.
This is most useful in systems which provide a separate *Enable* to the CLASS controller, or in those systems which de-activate the *Enable* when the door starts to close.

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Activating DA-I for Doors Closing will trigger a message when the signal at the *DA-I* input is de-activated.

Typical usage would be to connect the Door Open Solenoid signal to *DA-I*; when the Door Open Solenoid is de-activated, the message will be triggered.

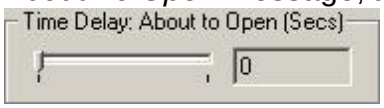
- If *DA-I* is not used for Door Closing, the following mode may be used for an Emergency message:

  Activating DA-I for EMG Warning will trigger a message when the Emergency (at the *DA-I* input) is activated

Note: If both a Door Closing and an Emergency message are desired, the Emergency may be connected directly to the Voice Annunciator. (See Voice Annunciator Parameters) 60

- Other Modes

  Activating Clear Area on Recycle will cause the Annunciator to play the *CLASS Detect* message (instead of the *Door Is Closing* message). The *CLASS Detect* message does not need to be turned on for this to function.

  Activating DA target open Warning turns on the following response:
  If the DA detects a target before the door is authorized, the VA will play the *About To Open* message, then after a a delay set here:
  

  the door will open.

  Activating Close Msg Once will play the Closing message only once when waiting for the door to close.

  Activating DA Once per target will ensure the Drunk Alarm message will play only once per acquired target. The target must go away before the message will be re-played. Useful when using DA Continuous Mode 34.

  Activating Clear Area on Detect plays the *CLASS Detect* message when a target is acquired and the closing signal is activated. The *CLASS Detect* message does not need not be turned on for this to function.

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[****] 60

6 Voice Annunciator

Setup for the Voice Annunciator depends on its intended use.

Use with CLASS™:
To use the Voice Annunciator with CLASS™, both the Voice Annunciator and the CLASS™ controller must be correctly configured.

In addition to the Voice Annunciator settings discussed in Voice Annunciator 63, settings in the CLASS™ controller must be configured as follows:

1. In Advanced Parameters 26, make sure to turn on

to enable messages
2. In Voice Annunciator Parameters 60, use the *Enable Message* and the *Modes* buttons to configure CLASS™ as required. Review the associated help file entries if necessary for those settings.

Note that configuring the Voice Annunciator options requires that the diagnostic computer be connected directly to the Voice Annunciator (see Connection 63 and RJ45 to DB9F Adapter Wiring) 99, while configuring the CLASS™ options requires connection to the CLASS™ controller.

WARNING: Do NOT use the Voice Annunciator adapter with the CLASS™ controller.
Doing so will cause the CLASS™ controller to enter programming mode at the next reset or power cycle.
To exit programming mode if this occurs, remove the Voice Annunciator adapter and power cycle the CLASS™ controller.

Use without CLASS™:
To use the Voice Annunciator with a PLC or as stand-alone, only the Voice Annunciator options need to be configured, requiring connecting only to the Voice Annunciator.

6.1 Connection

Connecting the Voice Annunciator:

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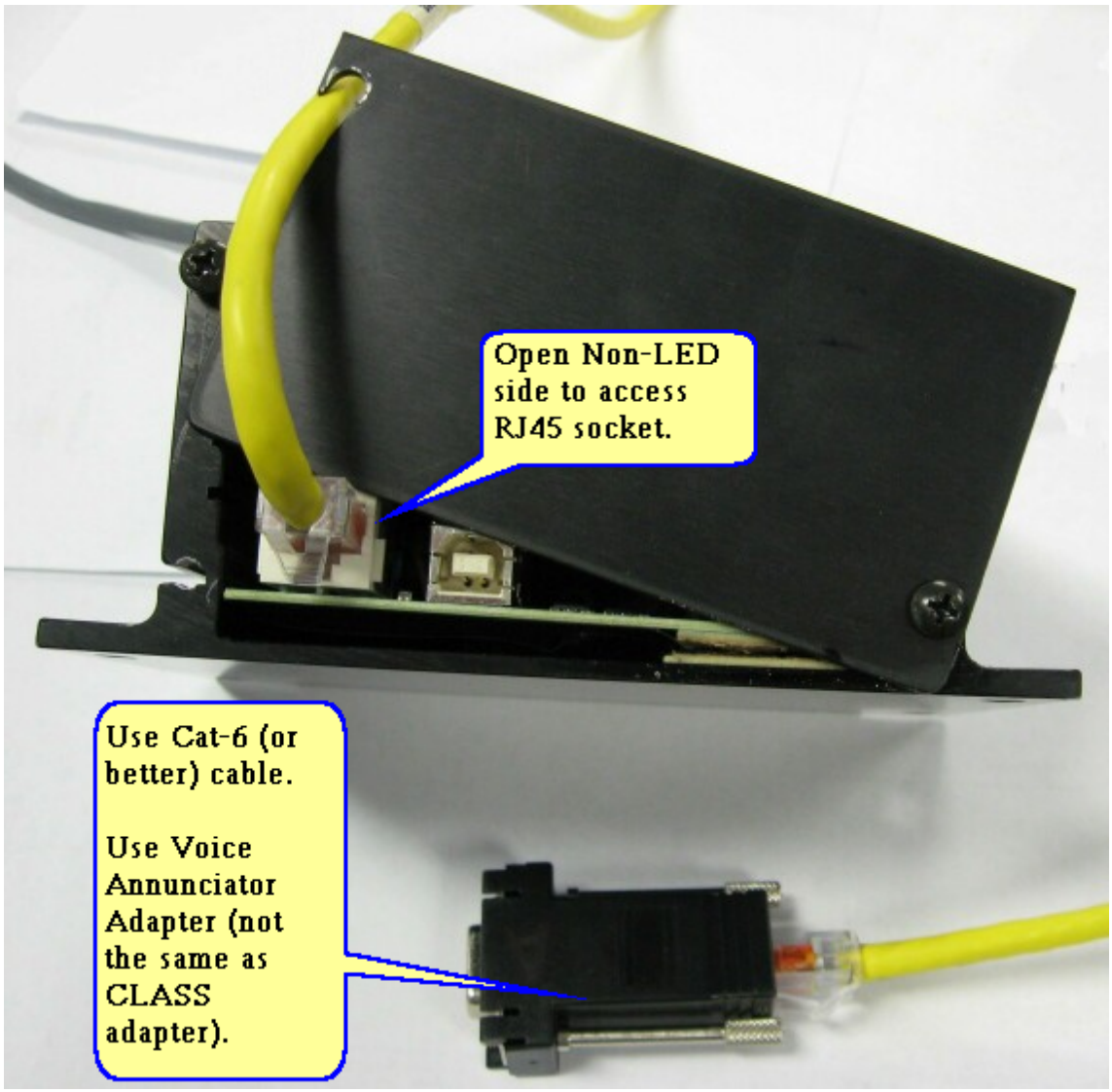
Open Non-LED side to access RJ45 socket.
Use Cat-6 (or better) cable.
Use Voice Annunciator Adapter (not the same as CLASS adapter).

Click on the adapter to see its wiring diagram.

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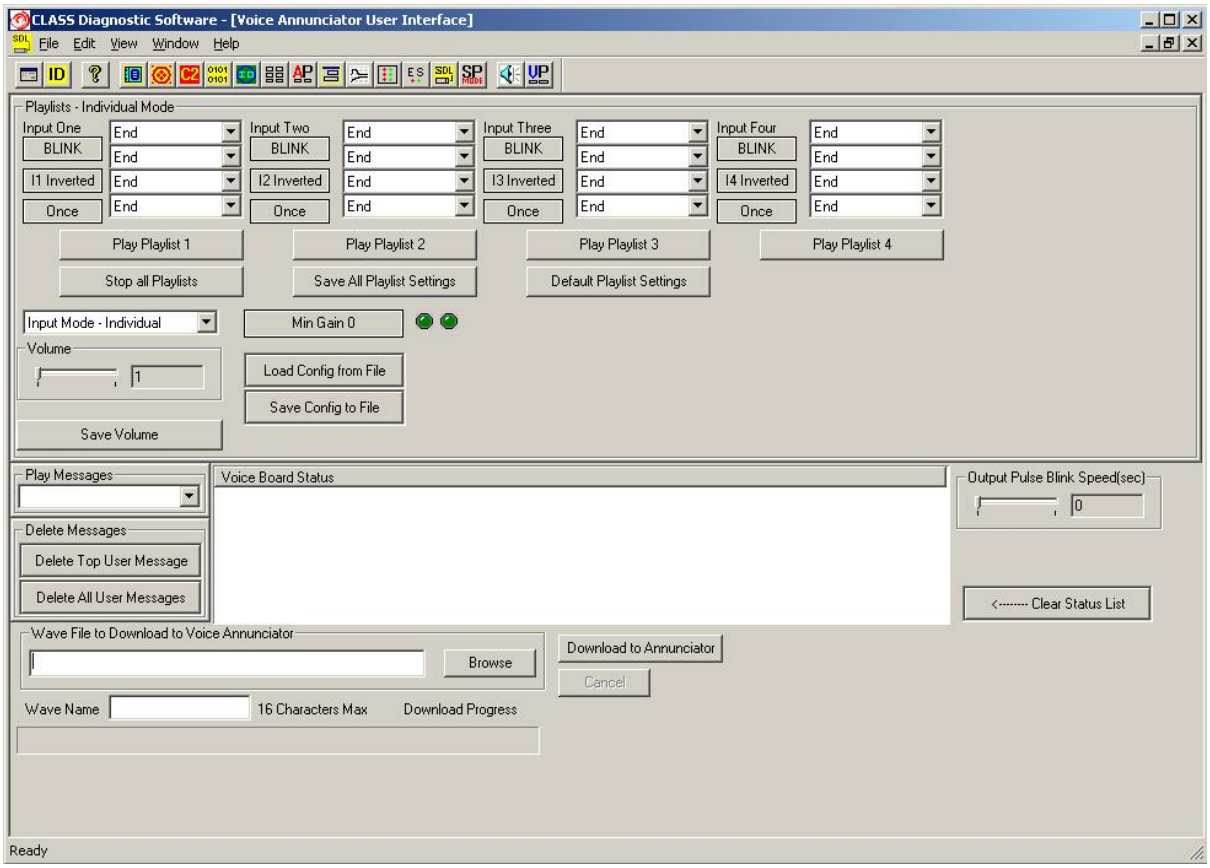
6.2 VA - User Interface

Note: the computer must be connected to the Voice Annunciator for the Voice Annunciator User Interface to function.
(See Connection 63.)

The Voice Annunciator User Interface is composed of two major sections: a *Setup* section at the top, and a *Message Play & Download* section at the bottom.



- **For Voice Annunciator setup with CLASS, see VA - Setup for CLASS 66**
- **For Voice Annunciator Stand-Alone operation, see VA - Setup for Stand-Alone 68**
- **For Voice Annunciator setup with a PLC, see VA - Setup for PLC Encoding 70**
- **For playing and saving messages, see VA - Message Play & Download 72**
- **For Wiring, see VA - Wiring 73**

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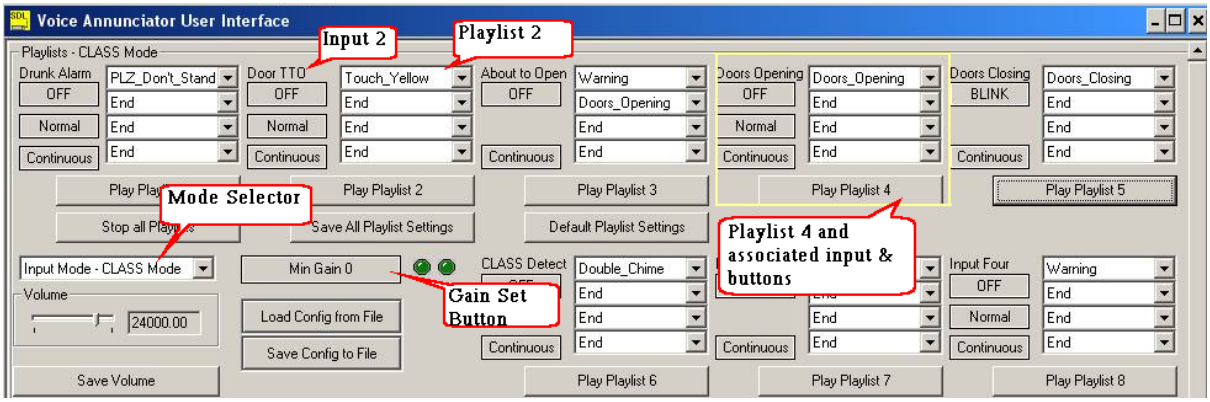
6.2.1 VA - Setup for CLASS



To configure the Voice Annunciator for operation with a CLASS™ controller:

1. Select ***CLASS Mode*** from the Mode Selector drop-down list as shown:

- When CLASS Mode is selected, eight playlists will be available. Each playlist allows the selection of up to four messages.

- Each playlist will have an associated CLASS controller input (shown at the upper left of the playlist), an associated *Once/Continuous* button, and may have an associated *Normal/Invert* button.

2. For each playlist, when the associated CLASS controller input activates, the messages shown in the playlist will be played in sequence (top to bottom). Each message will be played in turn until the first "End" is reached. Any message listed after an "End" will be ignored.

Note: Input 4 (Playlist 8) is not controlled by CLASS. It is an independent input and can be connected to non-CLASS systems. Typical usage is to connect it to the door Emergency. See VA - Wiring 73 for I4 (Input 4) connection details.

- If the associated ***Once/Continuous*** button is set to Continuous, the message sequence will play continuously as long as the associated input is active. Otherwise the sequence will play once per input activation. Click the button to change it.

- The ***Normal/Invert*** button sets the desired activation state: Normal means that the associated playist is played when the input becomes active, Invert means that the playlist will be played when the input deactivates. (A typical Invert usage is for an Emergency input switch which in normal operation is held closed; when an Emergency handle is pulled the switch opens. In that case, opening the switch would de-activate

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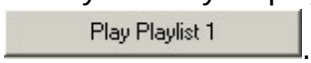
the input and thus play the playlist.)

3. Playlists may be changed by clicking the desired playlist message drop-down and choosing from the available messages:

Note: Messages ending in "ESP" are in Spanish.

4. Playlists may be played by clicking the associated button, such as 

.

5. Adjust the volume by setting the Volume Slider and using the Gain Set Button. The Gain Set Button allows gain values of 0 (Min) to 3(Max). For each Gain setting, the Volume slider will control the level within the minimum and maximum values of the selected Gain value.

Suggested setting: Volume = 24000, Medium Gain 2

6. If output drivers are to be used, see VA - Wiring 73.

7. Click

or

when settings are complete, or changes will be lost.

8. Clicking

allows the user to create and/or select a file in which current parameter values will be saved.

9. Clicking

allows the user to select a file whose values will be loaded as parameter values in the laptop diagnostic for editing and/or saving to the Voice Annunciator.

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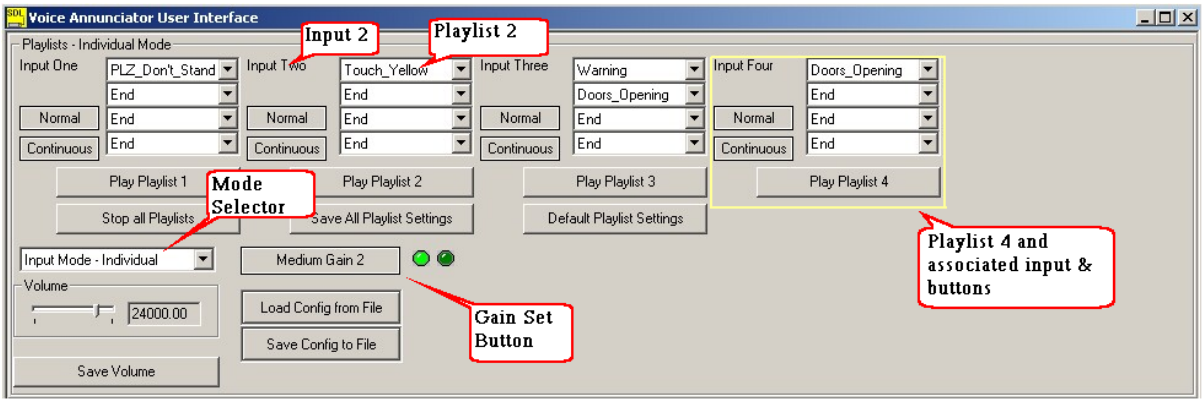
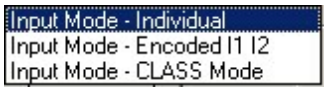
6.2.2 VA - Setup for Stand-Alone



To configure the Voice Annunciator for Stand-Alone operation:

1. Select ***Individual*** from the Mode Selector drop-down list as shown:



- When Individual Mode is selected, four playlists will be available. Each playlist allows the selection of up to four messages.

- Each playlist will have an associated input (shown at the upper left of the playlist), an associated *Once/Continuous* button, and may have an associated *Normal/Invert* button.

2. For each playlist, when the associated input activates, the messages shown in the playlist will be played in sequence (top to bottom). Each message will be played in turn until the first "End" is reached. Any message listed after an "End" will be ignored.

- If the associated ***Once/Continuous*** button is set to Continuous, the message sequence will play continuously as long as the associated input is active. Otherwise the sequence will play once per input activation. Click the button to change it.

- The ***Normal/Invert*** button sets the desired activation state: Normal means that the associated playist is played when the input becomes active, Invert means that the playlist will be played when the input deactivates. (A typical Invert usage is for an Emergency input switch which in normal operation is held closed; when an Emergency handle is pulled the switch opens. In that case, opening the switch would de-activate the input and thus play the playlist.)

3. Playlists may be changed by clicking the desired playlist message drop-down and choosing from the available messages:

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Note: Messages ending in "ESP" are in Spanish.

4. Playlists may be played by clicking the associated button, such as Play Playlist 1.

5. Adjust the volume by setting the Volume Slider and using the Gain Set Button. The Gain Set Button allows gain values of 0 to 3. For each Gain setting, the Volume slider will control the level within the minimum and maximum values of the selected Gain value.

Suggested setting: Volume = 24000, Medium Gain 2

6. Click Save All Playlist Settings or Save Volume when settings are complete, or changes will be lost.

7. Clicking Save Config to File allows the user to create and/or select a file in which current parameter values will be saved.

8. Clicking Load Config from File allows the user to select a file whose values will be loaded as parameter values in the laptop diagnostic for editing and/or saving to the Voice Annunciator.

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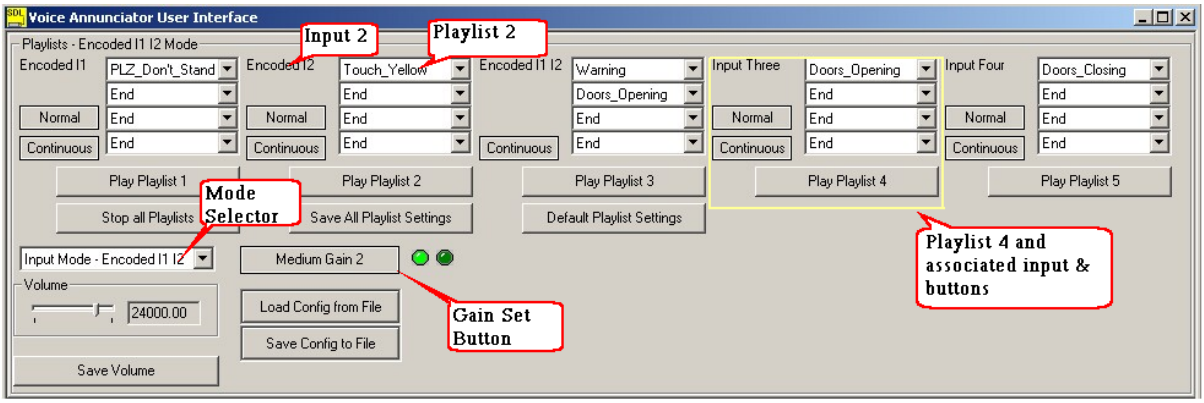
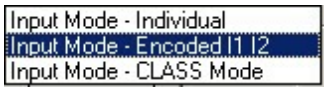
6.2.3 VA - Setup for PLC Encoding



To configure the Voice Annunciator for PLC Encoded operation:

1. Select ***Encoded I1 I2*** from the Mode Selector drop-down list as shown:



- When Individual Mode is selected, five playlists will be available. Each playlist allows the selection of up to four messages.

- Each playlist will have an associated input (shown at the upper left of the playlist), an associated *Once/Continuous* button, and may have an associated *Normal/Invert* button. For the PLC Encoded case, the first three playlists' associated inputs are binary-encoded results of two physical inputs (I1 and I2). Playlists 4 and 5 are associated with physical inputs 3 and 4 (I3 & I4).

2. For each playlist, when the associated input activates, the messages shown in the playlist will be played in sequence (top to bottom). Each message will be played in turn until the first "End" is reached. Any message listed after an "End" will be ignored.

- If the associated ***Once/Continuous*** button is set to Continuous, the message sequence will play continuously as long as the associated input is active. Otherwise the sequence will play once per input activation. Click the button to change it.

- The ***Normal/Invert*** button sets the desired activation state: Normal means that the associated playist is played when the input becomes active, Invert means that the playlist will be played when the input deactivates. (A typical Invert usage is for an Emergency input switch which in normal operation is held closed; when an Emergency handle is pulled the switch opens. In that case, opening the switch would de-activate the input and thus play the playlist.)

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3. Playlists may be changed by clicking the desired playlist message drop-down and choosing from the available messages:

Note: Messages ending in "ESP" are in Spanish.

4. Playlists may be played by clicking the associated button, such as Play Playlist 1.

5. Adjust the volume by setting the Volume Slider and using the Gain Set Button. The Gain Set Button allows gain values of 0 to 3. For each Gain setting, the Volume slider will control the level within the minimum and maximum values of the selected Gain value.

Suggested setting: Volume = 24000, Medium Gain 2

6. Click Save All Playlist Settings or Save Volume when settings are complete, or changes will be lost.

7. Clicking Save Config to File allows the user to create and/or select a file in which current parameter values will be saved.

8. Clicking Load Config from File allows the user to select a file whose values will be loaded as parameter values in the laptop diagnostic for editing and/or saving to the Voice Annunciator.

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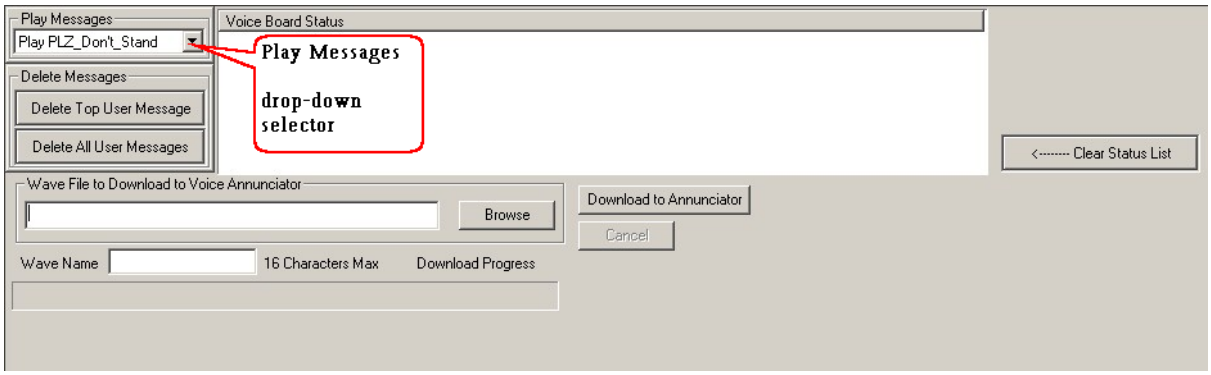
6.3 VA - Message Play & Download



Playing Messages:
Select the Message to be played in the ***Play Messages*** drop-down selector. The message will play when selected.

Saving Custom Messages:
Custom messages must be externally created; allowable file formats are as follows:
- Audio Sample Rates (KHz): 8.000, 11.025, 22.050, 44.100
- Audio Sample Sizes: 8 bit, 16 bit
- Channels: 1 (Mono)
- Audio Format: PCM
- File type: RIFF WAV
- Maximum file size: <1MB
- Maximum custom message storage space (total for all custom messages): 1MB

Messages initially provided are 11.025KHz, 16 bit, and do not subtract from custom message storage space.

To save a custom message:
1. Either type the file name in the ***Wave File to Download...*** box or Click the ***Browse*** button and select the wav file you wish to download.
2. Adjust the ***Wave Name*** as desired (maximum sixteen characters)
3. Click ***Download to Annunciator***.
4. Wait for the ***Download Finished*** notification. The custom message is now saved.

Deleting User Messages:
- Click ***Delete Top User Message*** and select ***Yes*** on the ***Proceed*** pop-up to delete the last message saved. If there are no user samples, nothing will be deleted.
- Click ***Delete All User Messages*** and select ***Yes*** on the ***Proceed*** pop-up to delete all user-saved messages. If there are no user messages, nothing will be deleted.

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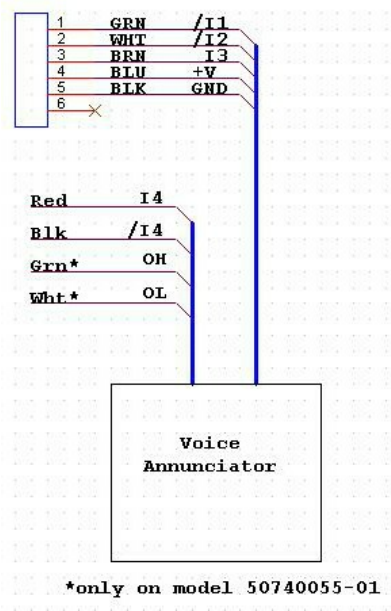
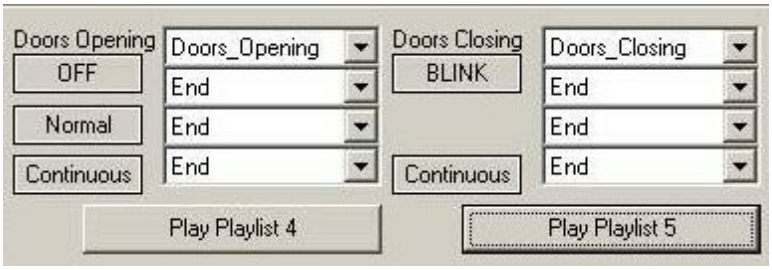
6.4 VA - Wiring



The 6-position connector is used to provide power to the Voice Annunciator and to provide triggers for messages. If plugged into a CLASS controller, CLASS can provide triggers for events of which CLASS is aware. The triggers for CLASS Mode operation are shown in the table.

The Red and Black wires are used if an external trigger (i. e., something of which CLASS is unaware, e.g., Emergency) is needed. Messages triggered by the Red wire (use for active-high trigger) or Black wire (use for active-low trigger) are selected using the *Input Four* playlist settings on the VA User interface.

The Green (active-high) and White (active-low) wires are outputs and may be used to drive a light, etc. These outputs are activated for a specific message by turning on the Blink button.



The outputs will toggle on and off as long as the message is being played. The on and off times are equal; the time for each is set in the Output Pulse Blink Speed control. Example usage: blink a lamp or buzzer while the door is closing.

Voice Annunciator in CLASS Mode - CLASS Output State			
Message	**/DAO (/I1)**	**/RCY (/I2)**	**RCY (I3)**
Please Don't Stand…	ON L	OFF H	OFF L
Touch Yellow Tape…	OFF H	ON L	OFF L
Warning Doors Opening…	ON L	ON L	OFF L
Doors Opening…	OFF H	OFF H	ON H
Doors Closing…	ON L	OFF H	ON H
Chime	OFF H	ON L	ON H
Emergency Warning…	ON L	ON L	ON H
NO MESSAGE	OFF H	OFF H	OFF L

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7 CLASS 2 (50130193)

7.1 General Notes

IMPORTANT: To change operating parameters, the controller must be in Test Mode 84.

- A target is entered as a distance (in centimeters) from the face of the sensor to the fixed object.
- The first (left-most) box MUST contain the distance to the floor.
- If TempComp Mode 81 is enabled, the second box MUST contain the distance to the cooperative object. (This applies only to LPS & RPS.)
- The next boxes contain any other fixed objects (e.g., brushes, handles, window ledges, etc.)
- Boxes MUST NOT be left empty - if no fixed target exists for a given box, a '0' must be entered.
- A zero ('0') is not allowed between any non-zero fixed targets; all zeros must be to the right. (The first zero encountered stops the reading of further target boxes for the specific sensor.)
- Fixed target values will also appear in the boxes at CLASS™ turn-on as a result of the turn-on calibration. The values seen will therefore be a combination of any values previously programmed and those detected at turn-on.

  To determine which targets are programmed and which are detected at turn-on, the following procedure may be used:

  1. Turn off the controller, disconnect all sensors, and turn the controller on. All targets now displayed are programmed targets.
  2. Record all the values which appear in the target boxes for each sensor (or Save To File 87).
  3. Turn off the controller, reconnect all sensors, and turn the controller on.
  4. Any targets in addition to those seen in step 2 were detected at turn-on.

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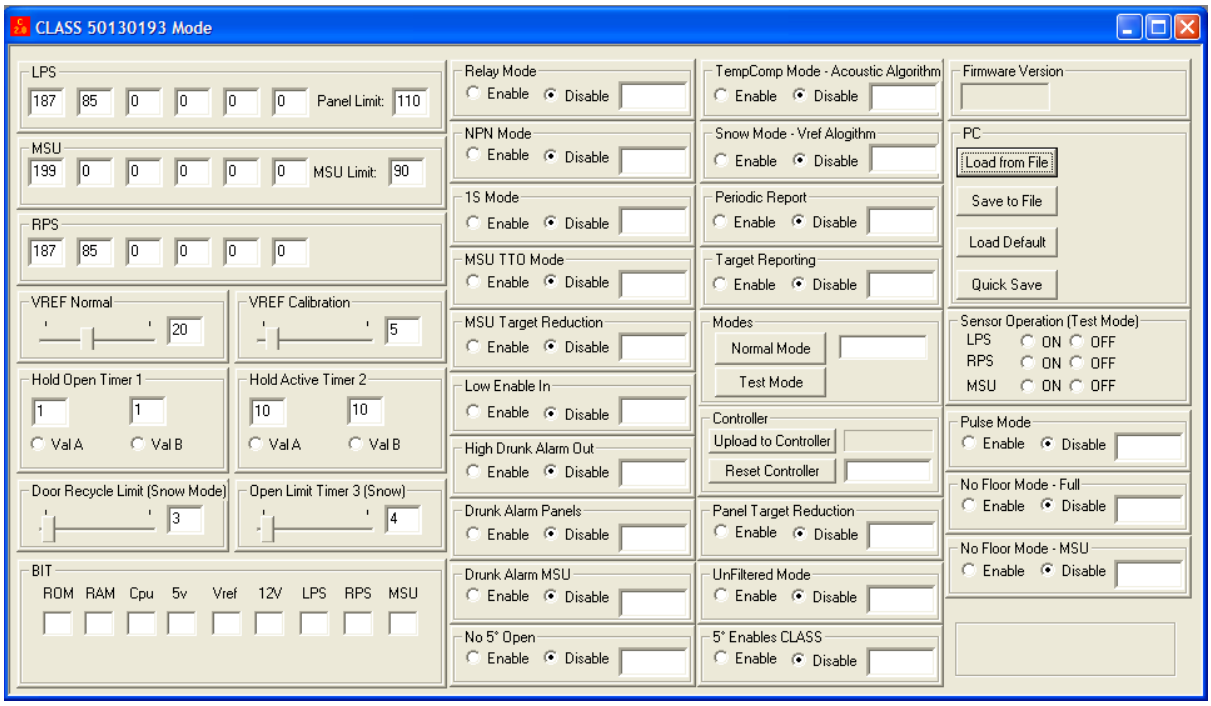
7.2 Parameters Window



See Changing Parameters 75 for more information.

7.3 Changing Parameters

To set or change parameters:

A. To change any parameter having only Enable/Disable choices (e.g. Relay Mode):

1. Press Test Mode 84
2. Press Reset Controller 85; wait until reset is complete (appropriate mode text will appear adjacent to Normal Mode button)
3. Set or change the desired parameter(s). (If not in Test Mode, a Reminder 91 message will apear.)
4. Press Normal Mode 84
5. Press Reset Controller 85; wait until reset is complete
6. Verify changes are as desired. (If not, go to Step 1.)

Note that uploading is not required to change these parameters.

B. To change any other parameter (e.g., MSU Limit):

1. Press Test Mode 84
2. Press Reset Controller 85; wait until reset is complete (appropriate mode text will appear adjacent to Normal Mode button)
3. Set or change the desired parameter(s). (If not in Test Mode, a Reminder 91 message will apear.)

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4. Press Upload to Controller 85; wait until upload is complete (shown by progress bar)
5. Press Reset Controller 85; wait until reset is complete
6. Verify changes are as desired. (If not, go to Step 3.)
7. Press Normal Mode 84
8. Press Reset Controller 85; wait until reset is complete

7.4 LPS

The boxes under ***LPS*** (Left Panel Sensor) are to enter/display fixed targets 1 seen by the LPS.

Range: Min = 30 Default = 85, 187 Max = 255

See Parameters Window 75 for control location.

7.5 Panel Limit

Panel Limit: The maximum distance from the Panel sensors (in centimeters) at which the Panel sensors will detect a target while the door is nearly closed (5º switch is active), if Panel Target Reduction 86 Mode is enabled. This is used to prevent the Panels from "seeing" extra targets while the doors are closed.

Range: Min = 30 Default = 110 Max = [LPS or RPS Floor value (whichever is smaller)]

See Parameters Window 75 for control location.

7.6 MSU

The boxes under ***MSU*** (Middle Sensor Unit) are to enter/display fixed targets 1 seen by the MSU.

Range: Min = 30 Default = 199 Max = 255

See Parameters Window 75 for control location.

7.7 MSU Limit

The box adjacent to ***MSU Limit*** allows entry of the maximum distance (in centimeters) that the MSU will detect a target while the door is closing (< 85º on closing). This is used to prevent the MSU from "seeing" brushes, etc.

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Note the MSU Limit is not in effect while the door is fully open.

Range: Min = 60 Default = 90 Max = [MSU Floor]

See Parameters Window 75 for control location.

7.8 RPS

The boxes under ***RPS*** (Right Panel Sensor) are to enter/display fixed targets 1 seen by the RPS.

Range: Min = 30 Default = 85, 187 Max = 255

See Parameters Window 75 for control location.

7.9 VREF Normal

VREF Normal is the voltage level above which an echo will be considered a target. This value applies in normal running mode, and determines the overall sensitivity of the CLASS™ detection - the lower the value, the greater the sensitivity.

Allowable Range: Min = 0.29, Default = 2.00, Max = 5.00

See Parameters Window 75 for control location.

7.10 VREF Calibration

VREF Calibration is the voltage level above which an echo will be considered a target. Note this value applies ONLY in calibration mode (turn-on detection of "fixed" targets).

Allowable Range: Min = 0.29, Default = 0.50, Max = 5.00

See Parameters Window 75 for control location.

7.11 Hold Open Timer 1

Hold Open Timer 1 (Relay Mode) is the time that the Door Open Command will remain active after the door reaches the 85º point (on opening). This parameter is effective only in the Relay Mode Version Firmware.

Allowable Range: Min = 0.1, Default = 1.0, Max = 9.9

ValA or ValB may be selected in Test Mode 84

See Parameters Window 75 for control location.

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7.12 Hold Active Timer 2

Hold Active Timer 2 (5°) is the time that CLASS™ will remain active (and able to re-open the door) after the door reaches the 5º point (on closing). When Timer 2 times out, CLASS™ will continue to remain active only if the door is still enabled.

Allowable Range: Min = 0.1, Default = 1.0, Max = 9.9

See Parameters Window 75 for control location.

7.13 Door Recycle Limit

Door Recycle Limit (Snow Mode) is the number of times the door will be allowed to recycle open before activating the Snow Mode response (only applicable if Snow Mode 81 is enabled.)

Allowable Range: Min = 3, Default = 3, Max = 10

See Parameters Window 75 for control location.

7.14 Open Limit Timer 3

Open Limit Timer 3 (Snow Mode) is the time that the CLASS™ unit will allow the door to remain open before activating the Snow Mode response (only applicable if Snow Mode 81 is enabled.) This timer starts when the door reaches the 85º point (on opening).

Allowable Range: Min = 4.00, Default = 4.00, Max = 20.00

See Parameters Window 75 for control location.

7.15 BIT

BIT (Built In Test) is run at CLASS™ controller turn-on. Text boxes indicate the Pass/ Fail status of each item tested.

Tests include:
ROM - verifies ROM is correct
RAM - verifies RAM is working
CPU - verifies CPU is functional
5V - verifies internal 5V supply is within tolerance
Vref - verifies analog functionality
12V - verifies internal 12V supply is within tolerance
LPS - verifies LPS is functional (via floor detection)

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RPS - verifies RPS is functional (via floor detection)
MSU - verifies MSU is functional (via floor detection)

See Parameters Window 75 for indicator location

7.16 Relay Mode

Relay Mode is used on buses whose doors are not controlled by a bus computer or PLC. When enabled, it ensures that the Door Open Command will remain active at least until the door reaches fully open.

See also: Hold Open Timer 1 77

See Parameters Window 75 for control location.

7.17 NPN Mode

Normally, ***NPN Mode*** is disabled, and CLASS expects that inputs IN1 (DFO) and IN3 (5°) are *actve-high* (switched to +24V when active).

When ***NPN Mode*** is enabled, inputs IN1 (DFO) and IN3 (5°) are *active-low* inputs (switched to Ground when active).

Note that when inputs IN1 (DFO) and IN3 (5°) are active-low, RIN1 and RIN3 must be connected to +24V.
Also, inputs IN1 (DFO) and IN3 (5°) must both be either active-high or active low.

See Parameters Window 75 for control location.

7.18 1S Mode

1S Mode is ONLY to be used for a "single-sensor" installation. It will turn off error detection for LPS/RPS. Note that MSU TTO Mode 79. must be enabled separately if that function is required.

See Parameters Window 75 for control location.

7.19 MSU TTO Mode

When enabled, ***MSU TTO Mode*** activates the MSU in the TTO 1 state so that it may respond to a passenger's request to open the door. (When not enabled, the MSU does not activate until the door reaches fully open.)

See Parameters Window 75 for control location.

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7.20 MSU Target Reduction

MSU Target Reduction mode, when enabled, will cause the MSU to ignore the memorizing of any fixed targets beyond the MSU Limit 76.

Default: Disabled

See Parameters Window 75 for control location.

7.21 Low Enable In

Normally, ***Low Enable In*** is disabled, and CLASS expects an *actve-high* Enable input (switched to +24V when active).

When ***Low Enable In*** is enabled, CLASS expects an *active-low* Enable input (switched to Ground when active).

Note that when Enable is active-low, RIN4 must be connected to +24V.

See Parameters Window 75 for control location.

7.22 High Drunk Alarm Out

Normally, CLASS provides an *actve-low* Drunk Alarm 1 output (switched to Ground when active).
When ***High Drunk Alarm Out*** is enabled, CLASS provides an *active-high* Drunk Alarm output (switched to +24V when active).

See Parameters Window 75 for control location.

7.23 Drunk Alarm Panels

Drunk Alarm Panels activates the Drunk Alarm 1 mode using the LPS and RPS.

Drunk Alarm Panels may be used independently or it may be used simultaneously with Drunk Alarm MSU 80

See Parameters Window 75 for control location.

7.24 Drunk Alarm MSU

Drunk Alarm MSU activates the Drunk Alarm 1 mode using the MSU.

Drunk Alarm MSU may be used independently or it may be used simultaneously with

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Drunk Alarm Panels 80

See Parameters Window 75 for control location.

7.25 No 5° Open

In typical operation, assuming the door is enabled or unlocked, CLASS will issue a door open request if it senses a target OR if the door is pushed open beyond the 5° switch actuation point.

Enabling the ***No 5° Open*** mode will cause CLASS to ignore the 5° switch as a door open request input.

See Parameters Window 75 for control location.

7.26 TempComp Mode

When enabled, ***TempComp Mode*** enables the CLASS™ system to improve its accuracy by measuring the temperature of the air near its sensors. Use of this mode requires that a "cooperative object" (a fixed object whose distance to the sensor is accurately known) be available for each sensor and its distance from the sensor be entered in the second box of the sensor's fixed objects table.)

See General Notes 74 for target placement when using this mode.

See Parameters Window 75 for mode control location.

7.27 Snow Mode

When enabled, the ***Snow Mode*** provides a way for CLASS™ to dynamically reduce its sensitivity to help deal with a target that occurs after turn-on calibration, such as that which might occur due to a build-up of wet snow on the door panels.

See also Open Limit Timer 3 78 and Door Recycle Limit 78.

See Parameters Window 75 for control location.

7.28 Periodic Report

When ***Periodic Report*** is enabled, CLASS™ will supply a constant data stream to a laptop detailing its system states and operation. This is intended only for advanced troubleshooting.

To enable or disable ***Periodic Report,*** CLASS must be in Test Mode 84.
Once enabled, data will be available only in Normal Mode 84.

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See Parameters Window 75 for control location.

See PeriodicReport Definition 82 for data stream definition

Important: *Periodic Report* should be turned OFF for normal operation.

7.28.1 PeriodicReport Definition

Message Format
The periodic report message is composed of three groups of letters in the following sequence:

[ST] [S] [SW]*

[ST]ate - Indicates the current system state
[S]ensor - Indicates which sensors are on.
[SW]itch - Indicates the status of all four inputs

[ST] Description
Id = IDLE
TT = TOUCH_TO_OPEN
DO = DOOR_IS_OPEN
DC = DOOR_IS_CLOSED
DF = DOOR_FULLY_OPEN
T1 = TIMER1_IS_ACTIVE
T2 = TIMER2_IS_ACTIVE
Ch = FLOOR_CHECK
Pw = POWER_UP_STATE
WC = WAIT_FOR CLOSE
SS = MSU_DETECT

[S] The active sensor information may be one of the following:
M = MSU
P = PANELS
A = ALL
N = NONE

---
*NOTE: the [SW] field only appears in the Periodic Report for CLASS 2.

For CLASS 3 use the Inputs/Outputs Window 44 to monitor input status.

[SW] The input status is in the format:

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[(IN3-5°**) (**IN1-DFO**) (**IN4-Enable**) (**IN2-DA**)]**

and indicates the status as: **1** = Active, **0** = Not Active.

The following permutations are available ('x' indicates don't care):

[0xxx] IN3-5° is not active (Door is open)
[1xxx] IN3-5° is active (Door is Fully closed)

[x0xx] IN1-DFO is not active (Door is not Fully open)
[x1xx] IN1-DFO is active (Door is Fully open)

[xx0x] IN4-Enable is not active (no Green light)
[xx1x] IN4-Enable is active (Green light)

[xxx0] IN2-DA activation is not requested
[xxx1] IN2-DA activation is requested

The following applies:
[00xx] = Door is opening or closing
[01xx] = Door is fully open.
[10xx] = Door is fully closed.
[11xx] = Illegal indication (Door cannot be simultaneously ully open and Fully closed)

[xx1x] : MSU activation is not allowed when CLASS is enabled
[xx01] : MSU activation is allowed when CLASS is not enabled

Example: TT P 1010 Touch-To-Open state,
PANEL Sensors are active,
Door is Fully Closed and Enabled

7.29 Target Reporting

When ***Target Reporting*** is enabled and any target is detected, CLASS™ will supply a data stream to a laptop identifying the sensor that saw the target and the calculated distance (in centimeters) to that target.

See Parameters Window 75 for control location.

Note: *Target Reporting* should be turned OFF for normal operation.

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7.30 Test Mode

Pressing ***Test Mode*** followed by Reset Controller 85 will set the CLASS controller so that:
-sensors may be manually controlled
-parameters may be uploaded
-operating modes may be selected
-timer values (ValA or ValB) may be selected
-Periodic Report may be enabled

The purpose of ***Test Mode*** is to allow setting of operating parameters and performing installation-only functions.

As opposed to Normal Mode 84, in ***Test Mode*** most of the controls on the Parameters Window 75 are "two-way", i.e., they will both show the current operating status of the controller, and also allow changing that status. Note the status will be accurate only if the controller has been Reset (or turned on) after the diagnostic is running. In addition, any operating modes indicated may change once the controller is Reset. Always verify that the values adjacent to the operating mode controls reflect what is desired after a Reset.

Note that without being connected to a controller, ***Test Mode*** is not available.

NOTE: the CLASS controller will remain in ***Test Mode*** until *Normal Mode* 84 is selected and ***Reset Controller*** is clicked.
(If the controller lights flash normally at power-up but the door will not open, it is likely that the controller is in *Test Mode*.)

The controller must be in Normal Mode to operate properly for passenger service.

7.31 Normal Mode

Pressing ***Normal Mode*** followed by Reset Controller 85 will set the CLASS controller to function normally
The controller must be in Normal Mode to operate properly for passenger service.

In Normal Mode, most of the controls on the Parameters Window 75 are "one-way", i.e., they will show the current operating status of the controller but not change that status. Note the status will be accurate only if the controller has been turned on (and thus Reset) after the diagnostic is running.

In Normal Mode:
-sensors can not be manually controlled
-parameters can not be uploaded
-operating modes can not be changed
-timer values (ValA or ValB) can not be changed
In addition, any operating modes indicated may change once the controller is Reset.

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Always verify that the values adjacent to the operating mode controls reflect what is desired after a Reset.

The first time (per session) the user attempts to change a parameter while in ***Normal Mode*** , a reminder 91 will be shown.

NOTE: the CLASS controller will remain in Test Mode 84 until ***Normal Mode*** is selected and ***Reset Controller*** is clicked.
(If the controller lights flash normally at power-up but the door will not open, it is likely that the controller is in *Test Mode*.)

One use for Normal Mode is as a means to create (or edit) a file to be saved and used later to program controllers. For this use, the diagnostic may be run without being connected to a controller. (See Save To File 87 and Load From File 87.) Note that without being connected to a controller, Test Mode 84 is not available.

7.32 Upload to Controller

Clicking the ***Upload to Controller*** button saves all parameters to the CLASS™ EEPROM.

It must be followed by clicking *Reset Controller* 85 after completion of upload.
(The progress bar to the right of the ***Upload to Controller*** button can be used to determine completion.)

See Changing Parameters 75 for more information.

See Parameters Window 75 for control location.

7.33 Reset Controller

Clicking ***Reset Controller*** will reset the CLASS™ controller. This will cause the BIT 78 to be run and new targets to be acquired.

As of firmware version 2.29, Reset Controller is functional in Normal Mode 84 (as well as in Test Mode 84).

See Parameters Window 75 for control location.

7.34 Reset Status

The **Reset Status** window (to the right of the *Reset Controller* button) contains various status information, including:
- notification of Upload in progress
- notification to Reset after Uploading

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- indication of active Reset status
- indication of successful Upload. **Upload OK** will be shown if successful, if not **Upload Fail** will be shown.

Note that **Upload Fail** may also be shown even for a successful upload if new targets are acquired after Reset.

7.35 Panel Target Reduction

Panel Target Reduction: When this mode is enabled:

1. Panel sensor targets that are below the Panel Limit 76 will not be added to the fixed target table during power-on calibration.
2. Panel sensors will only detect Targets above (higher up on the door than) the Panel Limit 76 while the door is nearly closed (5º switch is active.)

Default: Disabled

See Parameters Window 75 for control location.

7.36 5° Enables CLASS

Normally CLASS™ is enabled by one of Enable inputs becoming active. When the ***5° Enables CLASS*** mode is enabled:

a. Opening the door past 5º (deactivating the 5º switch) will also enable CLASS™.
b. Any target acquired in the *Door Is Opening* state will cause a door open request as long as the Enable inputs are NOT active.
(Normally, in the *Door Is Opening* state with Enable active, target acquisition will not cause door open requests to be issued since the door is already in the process of opening.)

Example uses:

- Driver-controlled door (no Enable signal available)
- With the emergency pulled and the door partially opened, CLASS™ will be enabled and able to send door open requests.

Note: when using ***5° Enables CLASS*** mode, it is strongly suggested to also enable No 5° Open 81 mode to prevent possible interaction.

See Parameters Window 75 for control location.

7.37 Unfiltered Mode

UnFiltered Mode: When Unfiltered Mode is enabled, the six percent required between acquired targets is disabled during

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power-up Calibration Sequence.

NOTE: This mode is ONLY for use during installation to look for multiple targets that may be near each other. This is NOT for normal operation.

Default: Disabled.

See Parameters Window 75 for control location.

7.38 FirmwareVersion

The ***Firmware Version*** box will contain the version of the firmware after a controller Reset 85 or Power-up

See Parameters Window 75 for control location.

7.39 Load From File

Clicking ***Load from File*** allows the user to select a file whose values will be loaded as parameter values in the laptop diagnostic for editing and/or saving to the CLASS™ controller.

See Parameters Window 75 for control location.

7.40 Save To File

Clicking ***Save to File*** allows the user to create and/or select a file in which current parameter values will be saved.

See Parameters Window 75 for control location.

7.41 Load Default

Clicking ***Load Default*** loads the values from the default file ("Default.txt") as parameter values in the laptop diagnostic.

See Parameters Window 75 for control location.

7.42 Quick Save

Clicking ***Quick Save File*** saves the current parameter values to the default file ("QuickSave.txt")

See Parameters Window 75 for control location.

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7.43 LPS On Off

Click the ***LPS On*** or ***Off*** button to manually turn on or turn off the LPS.

See Parameters Window 75 for control location.

7.44 RPS On Off

Click the ***RPS On*** or ***Off*** button to manually turn on or turn off the RPS.

See Parameters Window 75 for control location.

7.45 MSU On Off

Click the ***MSU On*** or ***Off*** button to manually turn on or turn off the MSU.

See Parameters Window 75 for control location.

7.46 Pulse Mode

Pulse Mode changes the behaviour of the CLASS Door Open Request output.

-When Pulse Mode is *Disabled*, the Door Open Request will be continuously active while any target is detected.

-When Pulse Mode is *Enabled,* the Door Open Request will be active for 1.25 seconds and then be inactive for 0.5 seconds; that sequence will repeat as long as any target is detected.

The Purpose of Pulse Mode is to accomodate PLCs that require transistions on the Door Open Request signal in order to keep the door open.

Click the ***Pulse Mode Enable*** or ***Disable*** button (while in Test Mode 84) to manually turn on or turn off the Pulse Mode.

See Parameters Window 75 for control location.

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7.47 No Floor Mode - Full

Normally, a target is detected by the presence of an echo from that specific target. ***No Floor Mode*** allows an absence of an echo from the floor (while in appropriate states) to be interpreted as a target. (This might occur if a sensor's sound pulse is "blocked" by a passenger's body or gloved hand, for example.)

The underlying assumption is that the floor should always be seen (in the states where No Floor Mode is active); if it is not seen, it is because a passenger wishes to exit.

No Floor Mode - Full affects the operation of both the Panel Sensors and the MSU.

(See also No Floor Mode - MSU 90, which affects only the MSU; Panel Sensors operate normally.)

When enabled, ***No Floor Mode - Full*** is active as follows:
('**Y**' denotes mode is active, 'N' denotes not active)

STATE	Panel Sensors	MSU
Disabled	N	N
Enabled (TTO 1)	**Y**	N*
Opening	N	N
Fully Open	N	**Y**
Closing	N	**Y**
Closed	**Y**	**Y**
Drunk Alarm	N	N

* Normally *No Floor Mode* is inactive for MSU in TTO.
If **both** MSU TTO Mode 15 and 1S Mode 79 are enabled, *No Floor Mode* will be active.

When using ***No Floor Mode - Full*** *or* ***No Floor Mode - MSU,*** *set* *Hold Open Timer 1* 77 *to 5 (0.5 sec) or greater.*

NOTE: if ***No Floor Mode - Full*** and ***No Floor Mode - MSU*** are both enabled, the table of ***No Floor Mode - Full*** will be in effect.

No Floor Mode - Full requires CLASS 2 firmware version 2.32 or greater

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7.48 No Floor Mode - MSU

Normally, a target is detected by the presence of an echo from that specific target. ***No Floor Mode*** allows an absence of an echo from the floor (while in appropriate states) to be interpreted as a target. (This might occur if a sensor's sound pulse is "blocked" by a passenger's body or gloved hand, for example.)

The underlying assumption is that the floor should always be seen (in the states where No Floor Mode is active); if it is not seen, it is because a passenger wishes to exit.

No Floor Mode - MSU affects only the MSU; Panel Sensors operate normally.

(See also No Floor Mode - Full 89**,** which affects the operation of both the Panel Sensors and the MSU.)

When enabled, ***No Floor Mode - MSU*** is active as follows:
('**Y**' denotes mode is active, 'N' denotes not active)

STATE	Panel Sensors	MSU
Disabled	N	N
Enabled (TTO 1)	N	N*
Opening	N	N
Fully Open	N	**Y**
Closing	N	**Y**
Closed	N	**Y**
Drunk Alarm	N	N

* Normally *No Floor Mode* is inactive for MSU in TTO.
If **both** MSU TTO Mode 15 and 1S Mode 79 are enabled,
No Floor Mode will be active.

When using ***No Floor Mode - MSU*** *or* ***No Floor Mode - Full,*** *set Hold Open Timer 1* 77 *to 5 (0.5 sec) or greater.*

NOTE: if ***No Floor Mode - Full*** and ***No Floor Mode - MSU*** are both enabled, the table of ***No Floor Mode - Full*** will be in effect.

No Floor Mode - MSU requires CLASS 2 firmware version 2.33 or greater

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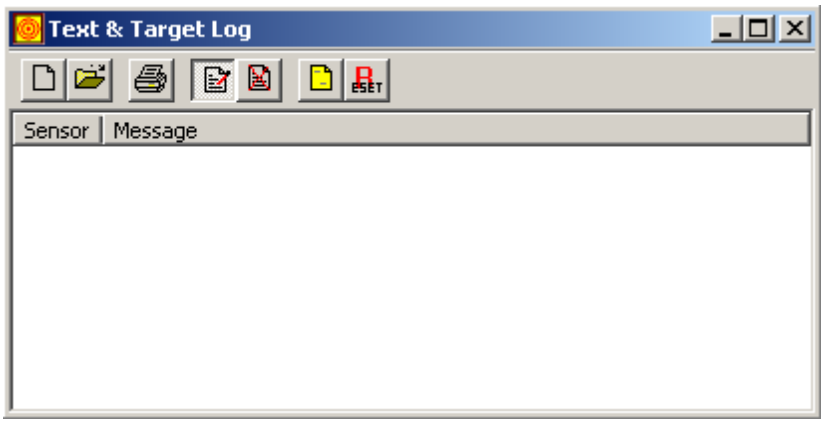
7.49 Reminder

CLASS Diagnostic Software
Reminder:
1. To change operating parameters, the controller must be in Test Mode.
2. Always verify that the values adjacent to the operating mode controls reflect what is desired AFTER a Reset.
OK

This message will appear the first time (per session) the user attempts to modify a parameter while in Normal Mode 84.

7.50 Text & Target Log

7.50.1 Text & Target Log Window



The **New** button will allow the user to open a new log file for data capture.

The **Open** button will allow the user to open any existing log file for data capture.

The **Print** button will print the contents of the Text & Target Log to an attached printer.

Pressing the **Start** button enables the logging of data. Note this button is automatically pressed when the *Text & Target Log* is opened. (Minimizing or restoring the T*ext & Target Log* will not change the state of the button.)

Pressing the **Stop** button disables the logging of data.

Pressing the **Clear** button erases any data in the *Text & Target Log*. Note that pressing the **Clear** button does not change whether data logging is enabled or disabled.

The **Reset** button performs the Reset Controller 85 function.

The T*ext & Target Log* window can be resized as desired.

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7.50.2 General Usage

The ***Text & Target Log*** contains three types of information:

- various system status messages,
- messages generated when Periodic Report 81 is active, and
- sensor and target distance information when either Periodic Report 81 is active or when Target Reporting 83 is active.

As messages are received, they are "pushed" downwards; the most recent message is at the top.

See Text & Target Log Window 91 for data location

7.50.3 Sensor

The ***Sensor*** column indicates which sensor received a target echo, or displays TXT for a text message.

See Text & Target Log Window 91 for data location

7.50.4 Message

The ***Message*** column contains system status messages.

See Text & Target Log Window 91 for data location

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8 Reference - CLASS Wiring

8.1 Sensor Wiring

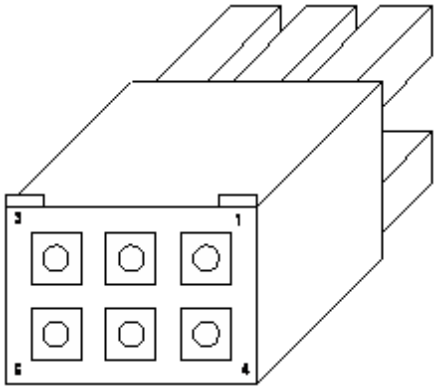
Panel Sensors (P4 & P6):

Pin #	Wire Colors	Signal
1	Red	POWER
2	Green or Orange*	SEND
3	Black	GROUND
4	White or Brown*	ECHO
5	Shield	SHIELD

Center Sensor (P5):

Pin #	Wire Colors	Signal
6	Red	POWER
5	Green or Orange*	SEND
4	Black	GROUND
3	White or Brown*	ECHO
2	Shield	SHIELD

***** Sensor Cable may be Red, Black, Orange, Brown, Shield
or Red, Black, Green, White, Shield



Pin insertion view shown above.
Top right is #1, top left is #3
Bottom right is #4, bottom left is #6

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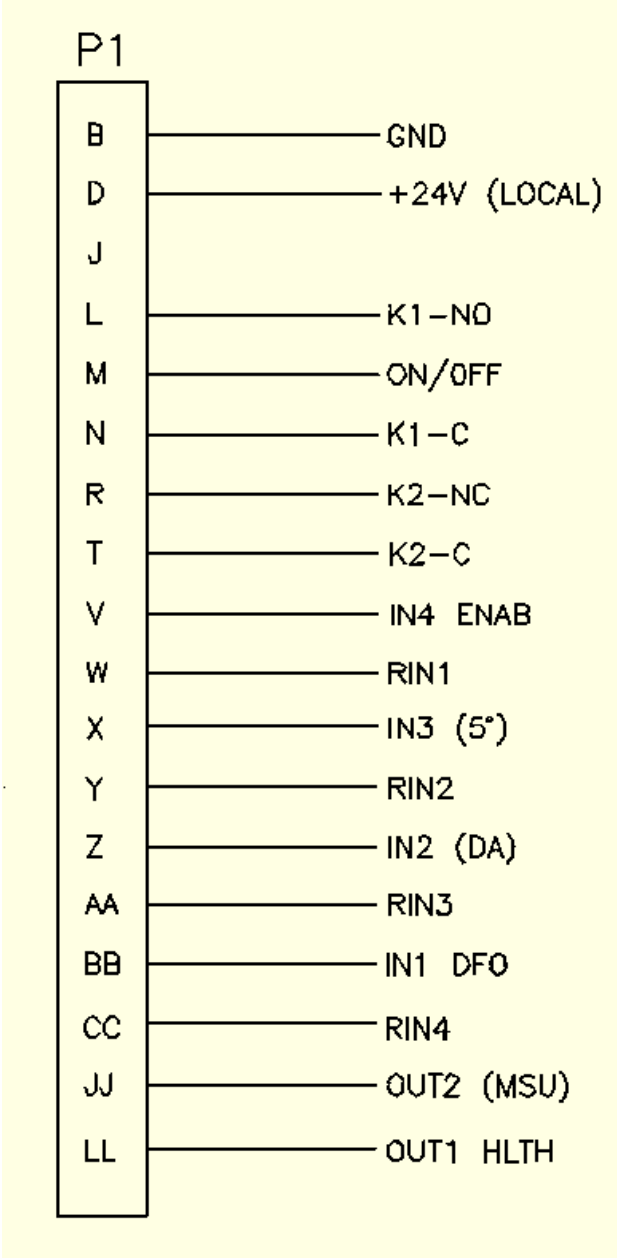
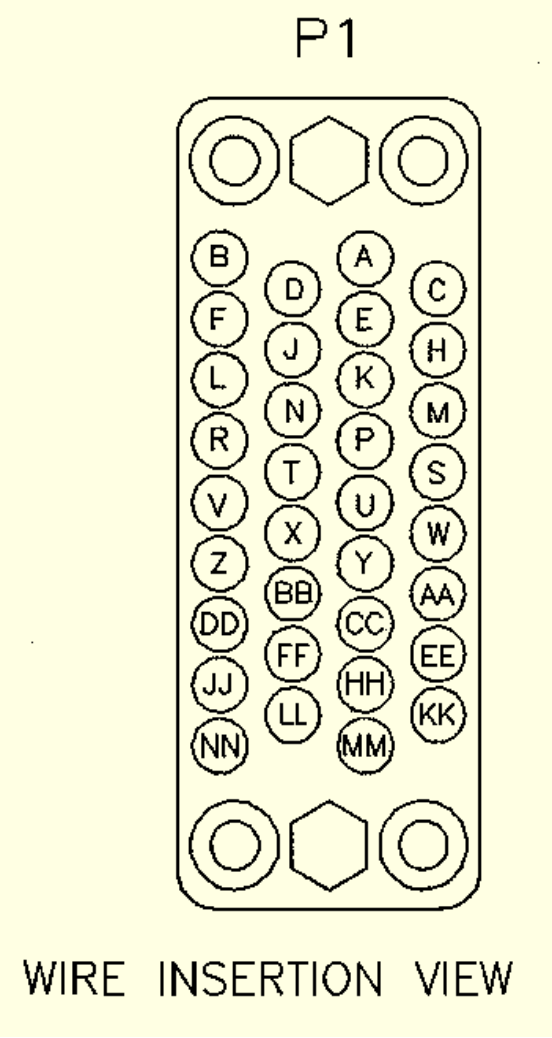
8.2 CLASS 2 Main Connector (P1)





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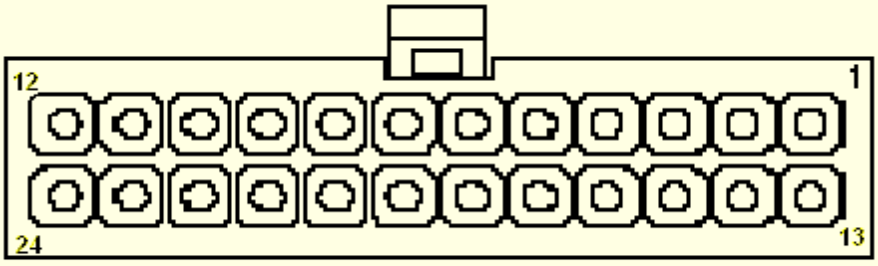
8.3 CLASS 3 Main Connector (P1)

P1

1	DFO
2	/DFO
3	DAI
4	/DAI
5	DNC
6	/DNC
7	ENA
8	/ENA
9	/STA
10	/DAO
11	/RCY
12	/OPN
13	OPN
14	RCY
15	K2C
16	K2NC
17	/TGT
18	PWR
19	K1C
20	K1-O
21	SWPW
22	On12
23	On24
24	GND



Pin Insertion View

Refer to TB08-03-192 (CLASS™ Installation and Setup User Manual) for signal details.

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8.3.1 CLASS 3 Input Wiring

Inputs to CLASS 3 are treated differently than inputs to CLASS 2. Inputs to CLASS 3 have more flexibility and require no special firmware settings (such as NPN mode).

Where CLASS 2 had 4 individual inputs, CLASS 3 has 4 pairs of inputs. Each pair has one of the pair designed for a signal switched to +V; the other is designed for a signal switched to GND. (Note that +V can be 12V or 24V nominal.)

Inputs to CLASS 3 are named functionally, and in each pair include a "/" as the first character of the name for the input designed for a signal switched to GND.

The names are:

DFO	&	**/**DFO	(IN1 & /IN1)
DAI	&	**/**DAI	(IN2 & /IN2)
DNC	&	**/**DNC	(IN3 & /IN3)
ENA	&	**/**ENA	(IN4 & /IN4)

There are four possible variations of input connection types. The following table shows the four types and how inputs to CLASS 3 are to be connected for various input types. Note that unlike CLASS 2, each input is unique, that is, any input can be utilized with any of the four possible connection types.

In the table, the input designed for a signal switched to +V is designated as ***INx***, where *x* represents 1 to 4.
The input designed for a signal switched to GND is designated as ***/INx***.

Actuation Type	**Connect Switch to:**	**Also Connect:**	**Safe End:**
Switch closes to +V when active	**INx**	-	**/INx**
Switch closes to GND when active	**/INx**	-	**INx**
Switch opens from +V when active	**INx**	**/INx to GND**	-
Switch opens from GND when active	**/INx**	**INx to +V**	-

Examples:

1. Enable provides +24V when green light is on:
   connect Enable to **ENA**

2. DNC switch closes to GND when door is fully closed:
   connect DNC-N.O to **/DNC**

3. DFO switch opens from +24V when door is fully open:
   conect DFO-N.O. to **DFO**; connect GND to **/DFO**

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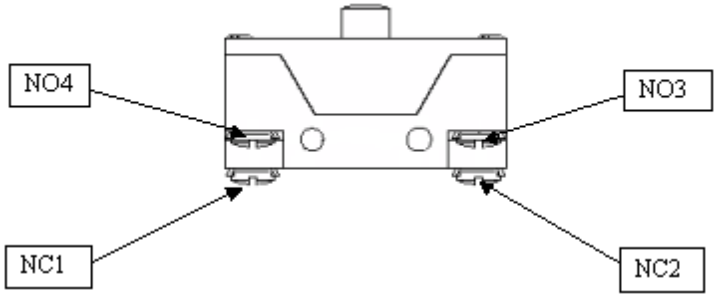
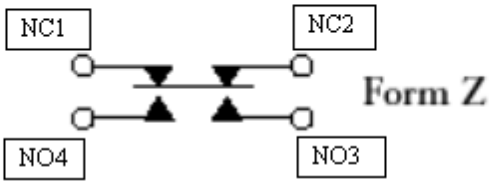
8.4 Switch Connections

8.4.1 Type 14

Type 14 Double-Break Snap-Action Switch

Operation:
When the plunger is released, the shorting bar connects NC1 to NC2.
When the plunger is pressed, the shorting bar moves, disconnecting NC1 from NC2, and connects NO3 to NO4.





8.4.2 Type 22

Type 22 Snap-Action Switch (with or without roller follower)

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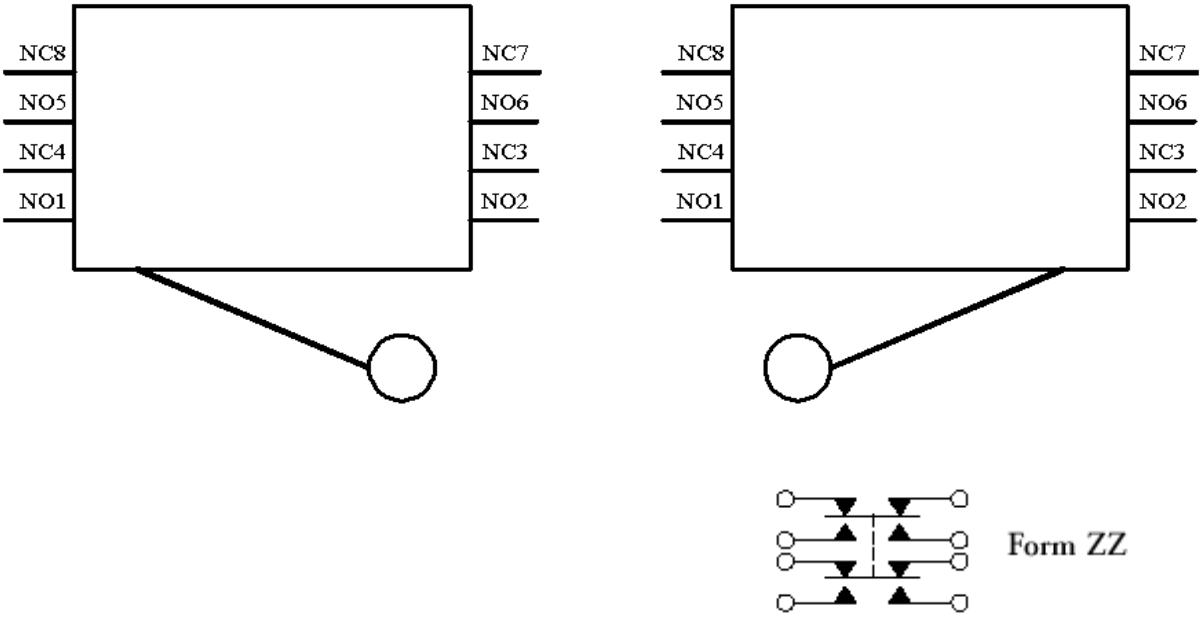
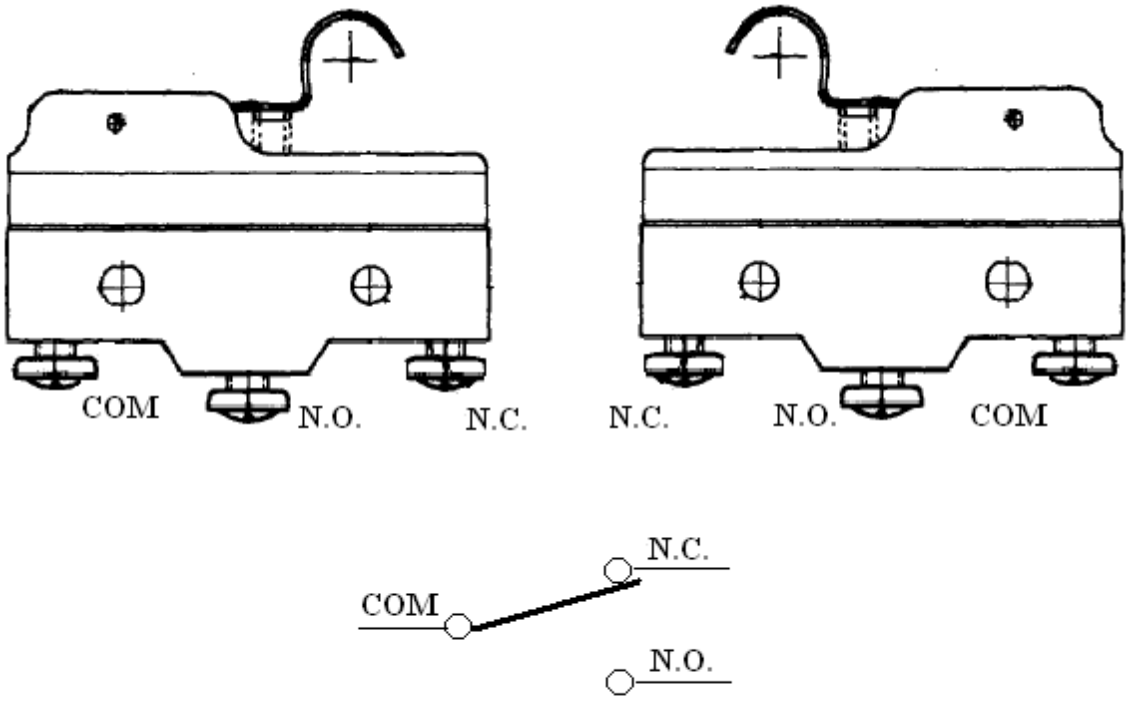


8.4.3 Type CZ

S.P.D.T Limit Switch Type CZ (may also be configured with roller follower)



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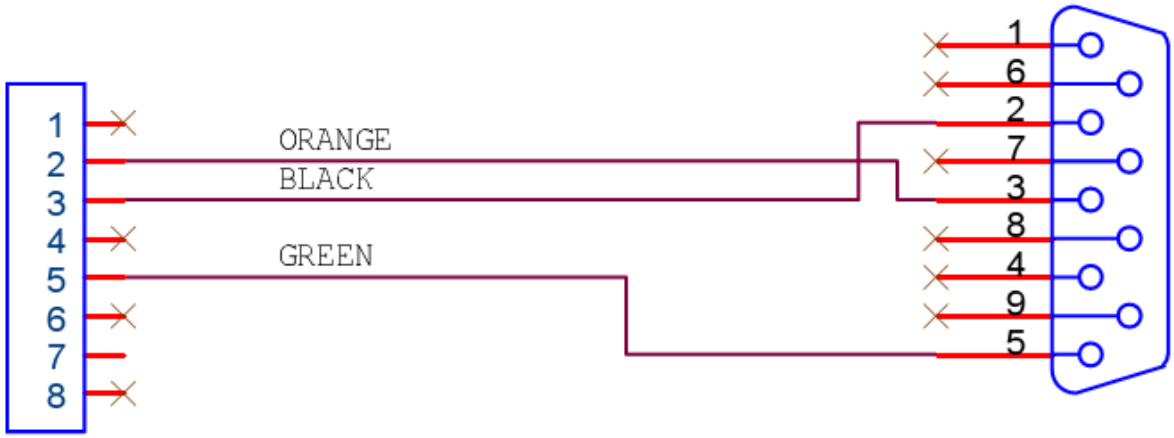
8.5 RJ45 to DB9F Adapter Wiring - CLASS

Typical DB9 Female to RJ45 Female Modular Adapter:

Wiring for CLASS™ Interface:



Vapor Part Number: 50520029-01

Note: for Voice Annunciator, use RJ45 to DB9F Adapter Wiring - VA 100 instead.

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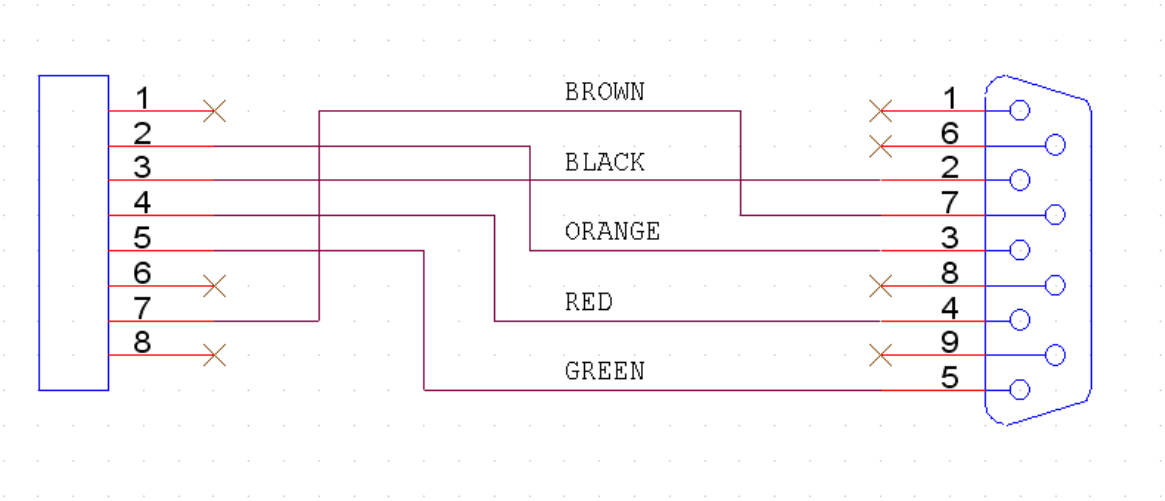
8.6 RJ45 to DB9F Adapter Wiring - VA

Typical DB9 Female to RJ45 Female Modular Adapter:

Wiring for Voice Annunciator Interface:



Vapor Part Number: 50520029-02

Note: for CLASS, use RJ45 to DB9F Adapter Wiring - CLASS 99 instead.

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9 Revisions

Version AL
-Revised Step-By-Step Setup 6 step 19

Version AK
-Added trigger table to VA - Wiring 73
-Revised Step-By-Step Setup 6
-Added BLINK explanation to VA - Wiring 73 and reference to VA - Setup for CLASS 66

Version AJ
-Added further explanation to Step-By-Step Setup 6, MSU Target Reduction 15, MSU Detection Limit 12, and MSU TTO Mode 15
-Reversed order of Revisions 101

Version AH
-Added trigger source to VA - Wiring 73
-added Stuck in Programming Mode 50

Version AG
-corrected VA - Wiring 73

Version AF
-added MSU comment to 5° Enables CLASS 19
-revised Exiting Programming Mode 48 to include use of the Set X2 button
-added or revised Modes in Advanced Parameters as follows:
-revised Medium Noise Mode 30 (Used to be *Further Noise Reduction*)
-added No DFO Open Req 28 mode
-added Invert Status Output 31
-added Cushion Valve On Close 32
-added Easy NoFloor Mode 33
-added Extend Floor Detection 35
-added Easy TTO Mode 36
-added Status On Sensors 36
-added DA VREF Mode 36
-added MSU Timeout Mode 36
-added new Voice Annunciator Modes to Modes 61

Version AE
- added BIT Failure Count to BIT Window 46 topic
- added VREF SPM to Self-Profiling Mode 40
- added No Floor consequence to Built_In_Tests_(Bit) 46 and references in No Floor sections
---
Version AD
- added Exiting Programming Mode 48 topic

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Version AC
- corrected wiring diagram for Connection 63

Version AB
- added clarifications under Voice Annunciator 63
- added VA - User Interface 65 and revised structure

Version AA
-Revised and added caution notice to Hold Open Timer 1 77
-Added notes to RJ45 to DB9F Adapter Wiring - VA 100 and RJ45 to DB9F Adapter Wiring - VA 100

Version Z
-Added RJ45 to DB9F Adapter Wiring - VA 100

Version Y
-Changed *50330055* to *CLASS 3*; Changed *50130193* to *CLASS 2*
-Changed Pulse Width Timer 4 to Open Request ON Time 22
-Added range values for Open Request OFF Time 22
-Changed "For diagnostic versions 3.26 and *below..*" to "ALWAYS..." on Save to EEPROM 36 in Advanced parameters and Save to EEPROM 23 in Standard Parameters
-Updated Advanced Parameters 26 topic to include Voice Annunciator Parameters 60, MSU DFO Table Mode 35, and DA NoFloor Mode 35
-Added Voice Annunciator 63 section
-Updated Product ID 2 and Toolbar Buttons 4

Version X
Added K2 Enabled Mode 34
Added warning notes on Save to EEPROM 36 in Advanced parameters and Save to EEPROM 23 in Standard Parameters

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Version W
Added RJ45 to DB9F Adapter Wiring 99 to show schematic

Version V
Revised Sensor Wiring 93 to show added wire colors

Version U (CLASS 3):
-Revised Parameters Window 10 now allows 10 targets per sensor
-Revised Advanced Parameters 26 Window has three new Modes
(Delay Boot Mode 33, No 5° Delays Boot 34, DA Continuous Mode 34)
-New Self-Profiling Mode 40

Version U (CLASS 2):

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-No changes

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